JOURNAL
OF THE
AMERICAN VETERINARY MEDICAL ASSOCIATION

In This Issue -- Convention Abstracts

See Page 163 for Important Convention Hotel Information

GENERAL ARTICLES

The Veterinarian's Responsibility to His Community—*A. L. MacNabb* 91
Basking Ridge Small Animal Hospital 94
The Development of an Aptitude Test for Veterinary Medicine—*Loyal C. Payne* 96
Cysticercosis and Trichinosis 100
Abstracts of Papers to Be Presented at the Eighty-Seventh Annual Meeting of the AVMA 102

SURGERY AND OBSTETRICS

Egg-Transfer Breeding in Cattle 122
Hoof Trimmers for Dehorning Calves—*J. W. Bailey* 123

CLINICAL DATA

Diagnosis of Liver Fluke Infection in Cattle—*Leonard E. Swanson and Howard H. Hopper* 127
An Approach to the Mastitis Problem—*M. G. Fincher* 130
Theileria Mutans Associated with Bovine Anaplasmosis in the United States—*Earl J. Splitter* 134
Methods of Internal Parasite Control in Sheep and Lambs—*J. P. Willman, D. W. Baker, and L. B. Embry* 136
Treatment of Infectious Sinusitis of Turkeys with Aureomycin—*J. E. Prier* . 139
Results of Penicillin Treatment During an Outbreak of Erysipelas in Turkeys—*P. D. DeLay and Bernard Koch* 142
A Field Test of Immunization Against Newcastle Disease (Pneumoencephalitis)—*Carl Olson, Jr., Ida C. Blore, F. R. Woodring, and C. B. McGrath* 144
The Practical Use of Diethylstilbestrol in Dairy Cattle Practice—*Carl F. Schlotthauer* 149
Rabies 151

NUTRITION

Recommended Nutrient Allowances for Horses 154

EDITORIAL

The Release of Scientific Information 156

Surgery and Obstetrics 122
Clinical Data 126
Nutrition 154
Editorial 156
Current Literature 158
The News 163

AVMA Report, ad page 8; Coming Meetings, ad page 22.

(*Contents continued on ad pages 2 and 4*)

Volume CXVII AUGUST 1950 Number 881

The Century's Second Ten Years

III. The Origin of "Graduates Only"

The slogan "graduate veterinarians only" is American born. First written into the literature of the commercial field during the 1910-1920 decade of the Century, the term gave an understandable name to an idea as old as the profession's Code of Ethics.

Not generally realized is that the thought expressed by the three words has since become a moral policy in all countries where a veterinary profession, based on private enterprise, has been instituted.

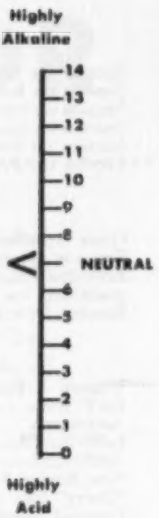
The veterinary world salutes "graduates only" because it signifies keeping toxic agents out of untrained hands in the public interest, and concurrently makes a clear-cut distinction between the supporters and the exploiters of veterinary medicine—between helping and hindering a learned profession.

THE
Corn States Serum Company
OMAHA, NEBRASKA

See the test for yourself
at the A.V.M.A. convention!

Sulfatose (Improved)

(patent pending)



is practically neutral (pH 7.0-7.5)

See for yourself an actual neutrality test being made on Sulfatose (Improved)!! Tests on the pH scale rating of Sulfatose (Improved) will be made at the display booths of Norden Laboratories at the annual A.V.M.A. convention.

Come and prove to yourself that Sulfatose (Improved) is practically neutral!

Packaged in 250 and 500 cc. bottles.

NORDEN LABORATORIES

"The Mark of Quality"

LINCOLN NEBRASKA

Journal of the American Veterinary Medical Association

CONTENTS

(Continued from Cover)

Abstracts of Convention Papers

Section on General Practice 102
Section on Research 106
Section on Surgery and Obstetrics 110
Section on Small Animals 113
Section on Public Health 114
Section on Poultry 118

Surgery and Obstetrics

Ovine Anesthesia 123
Twins in Mares 124
Pentothal-Procaine Combination 124
Anesthesia for Zoo Animals 125
Seminal Defect Causes Sterility 125

Clinical Data

Vitamin A Requirements for Turkeys 126
Ca/P Ratio for Quail 126
Acetonemia 129
Penicillin Ointment in Conjunctivitis 129
Antihistaminics 133
New Equine Narcotic 133
"Query" Not "Queensland" 133
Personal Towels for Cows 135

Officers: C. P. Zepp, Sr., *President*; W. M. Coffee, *President-Elect*; J. G. Hardenbergh, *Executive Secretary*; R. C. Klussendorf, *Assistant Executive Secretary*; W. A. Young, *Treasurer*.

Executive Board: W. G. Brock, *Chairman*; A. L. MacNabb, *1st District*; S. F. Scheidy, *2nd District*; O. Norling-Christensen, *3rd District*; R. S. Sugg, *4th District*; C. C. Franks, *5th District*; N. J. Miller, *6th District*; E. E. Wegner, *7th District*; W. G. Brock, *8th District*; Edwin Laitinen, *9th District*; B. J. Killham, *10th District*; C. P. Zepp, Sr., *ex officio*; W. M. Coffee, *ex officio*; L. M. Hurt, *ex officio*.

Board of Governors: W. G. Brock, Chairman; C. P. Zepp, Sr., W. M. Coffee (Committee on Journal).

Editorial Staff: J. G. Hardenbergh, *Managing Editor*; L. A. Merillat, *Editor-in-Chief*; R. C. Klussendorf, *Associate Editor*; Helen S. Bayless, *Assistant Editor and Advertising Manager*. *Associate Editors*: J. A. Campbell, J. N. Campbell, L. R. Davenport, Geo. R. Fowler, L. J. Goss, G. W. Jensen, E. Jungherr, Brig. Gen. J. A. McCallam, L. T. Railsback, R. E. Rebrassier, W. H. Riser.

Foreign Language Abstracting: Maj. Kenneth F. Burns, V. C. (Japanese); Ernest Froelich (Yugoslav); Chas. H. Haasjes (Dutch); Robert E. Habel (Russian); Rue Jensen (German); A. G. Karlson (Scandinavian); Ching-Sheng Lo (Chinese).

$7.50 per annum Foreign $8.00; Canada $8.00 Single Copies 75 cts. prepaid in U. S.

Published monthly at 600 S. Michigan Ave., Chicago, Ill., by the American Veterinary Medical Association. Entered as second class matter August 10, 1932, at the Post Office at Chicago 5, Illinois, under the act of March 3, 1879. Additional entry at Mendota, Ill. Accepted for mailing at special rate of postage provided for in Section 538, act of February 28, 1925, authorized August 10, 1932. Reproduction of any part of this publication is prohibited, unless special permission is given. Permission will be given if the purpose seems justifiable and, in signed articles, if the rights or requests of author are not violated thereby. Reprints should be ordered in advance. Prices will be quoted after publication. Please send prompt notice of change of address, giving both old and new. Advise whether the change is temporary or permanent. Address all correspondence to American Veterinary Medical Association.

Oral Control of Body and Mouth Odors in Pets

WITH

CHLORODOR

(CHLOROPHYLL-FRACTION TABLETS, PITMAN-MOORE)

Studies with orally administered, water-soluble chlorophyll-fraction [1,2,3,4] have demonstrated its capacity to neutralize body perspiration, mouth and breath odors[5] in humans.

Since many dogs offer the objection of mouth, body and rectal odors, Serling[6] undertook to try the effect of Chlorodor (Pitman-Moore) in a series of animal cases.

IT WAS FOUND THAT—

1. Chlorodor given orally, 100 mg. per 25 lbs. of body weight, aids in eliminating most objectionable body and mouth odors in dogs in 18-24 hours.
2. In suggested doses, Chlorodor was found to be nontoxic, well tolerated—does not affect digestion.
3. Chlorodor apparently acts as a catalyst in neutralizing malodorous substances of neutral, acid or base reactions.
4. Chlorodor serves as a useful adjunct in eliminating objectionable odors until the cause can be diagnosed, and, if possible, corrected.

CHLORODOR (PITMAN-MOORE) IS SUPPLIED IN 100 MG. TABLETS. BOTTLES OF 100.

PITMAN-MOORE COMPANY

PHARMACEUTICAL AND BIOLOGICAL CHEMISTS

Division of Allied Laboratories, Inc.

INDIANAPOLIS 6, INDIANA

REFERENCES:

1. Willstaetter, R.: J. Am. Chem. Soc. 27:323 (1915).
2. Buergi, E.: Deutsche med. Wchnschr. 48:1159 (1922).
3. Buergi, E.: Klin. Schnschr. 9:789 (1930).
4. Buergi, E.: Das Chlorophyll als Pharmakon, Leipzig, G. Thieme, (1932).
5. Westcott, F. H.: New York State J. M. 50:698 (Mar. 15) 1950.
6. Serling, M. E.: Control of Body and Breath Odors with Chlorophyll Fractions (to be published).

CONTENTS—Continued

Testing Tuberculin Potency 141
Mastitis in a Goat 148
Treatment of Hyperkeratosis 148
Sulfamethazine for Caprine Enterotoxemia 150
Warble Fly Control 150
Preventing White Scours 150
Report 7,597 Rabies Cases in 1949 151
Rabies—Control Measures 151
Countries Free from Rabies 152
Three Steps for Controlling Rabies 152
Rabies-Control Program in New Jersey 152
Antirabic Vaccination Solid 152
Rabies Is a Global Problem 153
The Price of Disease Control 153

Editorial

Lift the Veil of the Near Past 157
Re: Military Status of Veterinarians 157
Cost of Slaughterhouse Blue Prints 157

Current Literature and Films

Abstracts

Newcastle Disease Virus Photographed, 158; The Pathogenesis of Mastitis, 158; Hormones and Reproduction, 158; Mastitis Treatment with Subtilin and Bacitracin, 158; The Brucella Ring Test, 158; Thyroidal Stimulation in Dogs, 159; Chlordan Toxicity, 159; Johnin and Tuberculin Tests, 159; Persistence of Brucella Infection in Cattle, 159; Canine Anemia and Hypoproteinemia, 159.

Books and Reports

Pharmacopeia of the United States of America, 160; The Principles of Anatoxins, 160; The Merck Manual, 160; Special Surgery, 161; Dog Owners Guide, 161.

Reviews of Veterinary Medical Films

Training You to Train Your Dog (Advanced), 161; Man's Best Friend, 161; Ascariasis (PMF 5124), 162; Cushing's Experiment with the Dog (PMF 5111), 162; Sentinels of Milk, 162.

The News

Latest Information on Miami Beach Hotel Reservations 163
Last-Minute Notes on the Miami Beach Convention 163
AVMA Files Protest Against Federal Poultry-Labeling Plan 164
Veterinary Pathology Curriculum 164
Action Postponed on U. S. BAI Intrastate Meat Inspection 164
Midwest Veterinarians Inspect Purina Research Facilities 165
Motion Pictures Added to Scientific Exhibits 165
Brucellosis Congress 165
Pan American Sanitary Organization 165
Student Chapter Activities 166
Women's Auxiliary 166
U. S. Government 168
Applications 168
Commencements 182
Among the States and Provinces 189
Foreign News 191
Veterinary Military Service 192
Deaths 192

Miscellaneous

Veterinarians in Public Health Work, 99; AVMA President to Be Featured on National Farm Hour, 121.

An' Related Topics ..... ad page 22

The heart of balanced feeding . . .

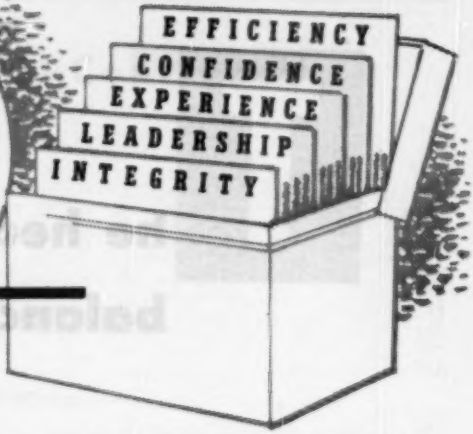
A food such as Gaines Meal is no mere filler . but a product carefully and scientifically formulated to provide adequate amounts of every food element known to be needed by a normal dog . . . plus an overage of vitamins and key minerals sufficient to offset the nutritive deficiencies of meat and other foods commonly added for increased palatability.

So make full use of the nutritional balance Gaines is designed to provide . . . and of the practical advantages offered by meal . . . look to Gaines Meal as the heart of normal, balanced feeding.

Copyright 1948 by General Foods Corp.

A Product of General Foods

WHAT'S IN A NAME?



Researching constantly into the needs of progressive veterinarians, National Laboratori**E**s Corporation has, not only kept pace with a fast-growing, important profession, but a**L**so, through most advanced research, NLC keeps abreast with each new discovery—g**I**ves veterinarians ever better, ever more potent drugs and medication in their fight ag**A**inst disease. The NLC trademark is based on reliable products, compounded of the **B**est in raw materials and chemicals. In the hands of trained, skilled laboratory chem**I**sts these are carefully analyzed to meet the exacting government tests for purity. The N**L**C trademark is based on service. With branch offices strategically located in a nation-w**I**de livestock network, even remotely stationed veterinarians can rely on the efficien**T** National Laboratory Corporation deliveries, analyses of specimens today and everyda**Y**.

Look for the name National Laboratory Corporation on pharmaceuticals and biologicals. Depend on the NLC trademark for reliability of products and service.

NLC

SERVING GRADUATE VETERINARIANS EXCLUSIVELY

THE
NATIONAL LABORATORIES
CORPORATION
KANSAS CITY

Swift gives you proof (nutrient for nutrient) that you can recommend PARD in *exactly* these words . . .

"Feed your dog as well as you feed yourself!"

"Pard gives your dog as much nourishment as you get in this hearty, nutritious roast beef dinner!"

Look how these dinners compare!

		ROAST BEEF DINNER	PARD (1 CAN)
Protein	(gms.)	23.0	52.8
Carbohydrate	(gms.)	23.6	48.7
Fat	(gms.)	20.1	14.7
Iron	(mgs.)	4.91	22.7
Calcium	(gms.)	0.09	2.0
Phosphorus	(gms.)	0.36	1.59
Vitamin A	(units)	401.0	350.0
Thiamine	(mgs.)	0.31	1.41
Riboflavin	(mgs.)	0.29	1.86
Niacin	(mgs.)	7.36	18.3
Energy:		Roast beef dinner: 17.4% of daily caloric needs for average man	
		Pard (1 can): 100% of daily caloric needs for 20-lb. dog	

And only Pard can give you this *added* assurance: For 15 years in Swift's own research kennels, *eleven* consecutive generations of dogs (over 1500 dogs, over 250 litters!) have been raised on an exclusive diet of Pard, have never known any other food. They have thrived, full of health, life and vigor, on this single, *complete* food . . . with normal reproduction.

Here's proof, GENERATIONS of it, that when a dog is fed Pard he needs nothing more. And he can get nothing better!

FROM THE RESEARCH LABORATORIES OF SWIFT & COMPANY

AVMA ☆ Report

Veterinary Medical Activities

✦ The Board of Governors (Executive Board Chairman W. G. Brock, President C. P. Zepp, Sr., and President-Elect W. M. Coffee) met in Chicago on June 17 and 18, 1950, to discuss and act upon matters of AVMA business, budget, and membership.

★ ★ ★

✦ Abstracts of the Miami Beach Convention papers appear in this JOURNAL They are published at this time to permit members to get a cross-section picture of the meeting. We regret that not all speakers responded to the request from the program committee for abstracts, and that the nature of some of the panels is such that abstracting was not possible.

★ ★ ★

✦ President-Elect W. M. Coffee attended the New York State Veterinary Medical Society meeting at Saranac, June 29-July 1, 1950, to carry the message of AVMA progress, and to participate in the scientific program. President C. P. Zepp, Sr., also attended this meeting of his home state association.

★ ★ ★

✦ At the American Medical Association meeting in San Francisco, June 26-30, 1950, the AVMA presented an educational exhibit titled "Parasites—Animal and Human" which tells the story of cysticercosis and trichinosis. The display was prepared by the Special Committee on Scientific Exhibits, Drs. J. S. Bengston (chairman), E. A. Benbrook, R. J. Cyrog, J. V. Lacroix, and C. D. Van Houweling.

★ ★ ★

✦ The Fellowship Committee of the AVMA Research Council has awarded fellowships for 1950-1951 to Drs. A. W. Monlux, W. J. Hadlow, B. F. Hoerlein, A. S. Grieg, J. E. Moulton, and L. E. McDonald. More complete information will be presented later regarding the work involved and the institutions at which it will be done.

★ ★ ★

✦ Executive Secretary J. G. Hardenbergh spoke to the Michiana VMA at La-Porte, Ind., June 8, 1950, on "The National Organization and How It Functions." During the last three days of June, Dr. Hardenbergh worked out final arrangements for the Annual Convention with the Committee on Local Arrangements in Miami Beach.

★ ★ ★

✦ Preprints of the Committee Reports have been mailed to all delegates from the constituent associations to the House of Representatives, in accordance with the By-Laws. These were mailed seven weeks before the Convention to permit careful reading and discussion before final action is taken on them at Miami Beach.

★ ★ ★

✦ All veterinarians were benefited when the American Broadcasting Company presented the motion picture "Valiant Years" on their full coast-to-coast network of television stations on June 18, 1950. This is the film sponsored by the Associated Serum Producers and recently selected by Kiwanis International for its list of recommended programs.

★ ★ ★

✦ Director of Professional Relations C. D. Van Houweling attended the meeting of the California State VMA at Berkeley, June 26-28, 1950, and also the American Medical Association meeting in San Francisco, where he was in charge of the AVMA Scientific Exhibit (*see* pp. 100-101).

★ ★ ★

✦ President-Elect W. M. Coffee plans to have all of his committee appointments completed and verified before the Miami Beach Convention. It is expected that many of the groups will meet to discuss their problems and get under way for the ensuing year.

★ ★ ★

✦ Mr. L. R. Fairall, public relations counsel for the AVMA, has arranged with radio stations in Miami Beach and Miami for a series of more than 20 broadcasts and transcriptions during the Convention. Members will be contacted to fill the spots provided.

V-PEKTAMALT

INDICATED in gastro-enteric disorders of pets and in certain gastro-intestinal abnormalities of large animals.

CONTAINS: PECTIN in unusually high potency (10 grs. per oz.)—detoxifier and demulcent—inactivates by-products of intestinal infection.

KAOLIN (colloidal) in high concentration (100 grs. per oz.)—adsorbent—protective to inflamed intestinal wall. MALT BASE — nutritional — speeds return to normal gastro-intestinal functions.

A permanent suspension—patient acceptance and tolerance assured—no astringent drug, with resultant constipation. Veterinarians report a quicker and more complete therapeutic response.

Supplied in pints and gallons.

WARREN-TEED

Veterinary Products

Meticulously Manufactured for Large and Small Animals

Sold ONLY to Graduate Veterinarians throughout the nation

THE WARREN-TEED PRODUCTS CO.

COLUMBUS 8, OHIO

NEW YORK DALLAS
LOS ANGELES PORTLAND

Visit our Booth At Miami—No. 26

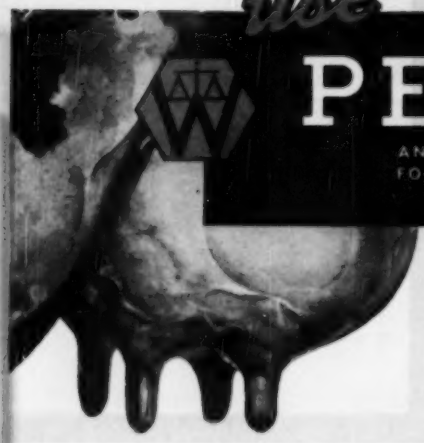
to avoid disappointment in

TREATING MASTITIS

use

PENICLE

ANTIBIOTIC VEHICLE OF CHOICE FOR INTRAMAMMARY INFUSIONS*



Successful penicillin therapy of bovine mastitis is often hampered by failure to provide *therapeutic* concentrations of the antibiotic in the infected quarter for *long enough* periods.

Leading veterinarians have met this problem by selecting **PENICLE** as a vehicle for administering antibiotics in thousands of cases because:

❶ The physicochemical properties of **PENICLE** facilitate permeation of the milk-duct system . . . and help to achieve sustained contact of the antibiotic with the offending organisms.

❷ A single injection of 100,000 units of penicillin in 20 cc. of **PENICLE** ensures the establishment of therapeutic levels which persist for at least *three days*, or six milkings, while the cow remains on a twelve-hour milking schedule. This therapy is particularly effective in bovine mastitis due to *S. agalactiae*, the most common causative factor.

❸ *Each batch of* **PENICLE** *has been biologically tested for its power to maintain a therapeutic concentration of penicillin for seventy-two hours.*

❹ **PENICLE** has received the benefit of thorough experimental and clinical study.

PENICLE is available to graduate veterinarians only. Complete literature on request.

SUPPLIED: Bottles containing 100 cc., cartons of 12 bottles. *Special prices on half-gross and gross quantities.*

PENICLE was developed after years of research. *Accept no substitutes!*

Veterinary Division

WALLACE LABORATORIES, INC. *53 PARK PLACE, NEW YORK 8, N. Y.*

This man should save up to $24.00 per ton

. . . by making his own swine feeds from his own corn and oats, plus proteins from his local elevator and Vitamineral Supplements through you. Not only a generous saving . . . but . . . such home made feeds should go further and do more by being bolstered, fortified and enriched with 4 sources of vitamins, 4 major minerals and 7 trace minerals supplied through Vitamineral Supplements.

Free Feed Manuals

Give formulae for easy-to-make sow, gilt and pig feeds. Write for your supply of our 32-page "Profitable Pork Producing Program" manual. Every one of your swine raising clients will appreciate a copy.

Vitamineral Products Company

Pioneers in Supplement Feeds for the Veterinary Profession

(Established 1920) Peoria 3, Illinois

Liver Condemnations in Sheep Due to Fringed Tapeworm

NOW REDUCED 75%

WITH

TENIATOL®

(DI-PHENTHANE-70, PITMAN-MOORE)

"A new drug, Teniatol, is saving millions for the western sheep industry.

"The drug is cutting down the death toll of sheep infected with the fringed tapeworm . . . Veterinarians say Teniatol has reduced death losses in lambs on heavy feeding from 4½ per cent to ¾ of 1 per cent. It also has reduced condemnation of livers in lambs at packing houses from 25 per cent to 6 per cent."[1]

These figures attain added significance in view of the statement of Eveleth and Goldsby[2] quoting Harshfield who found no significant reduction in liver infestation of feed lot lambs drenched with copper sulfate-nicotine sulfate solution over untreated controls. Lambs given enterotoxemia vaccine continued to die but death losses were markedly reduced after drenching with Teniatol.

Teniatol is a 15% suspension of Di-Phenthane-70—sold only to the veterinary profession.

LAY EDUCATIONAL CAMPAIGN

We are directing an intensive journal campaign to sheep raisers telling them about this new and better method of controlling tapeworm in sheep. Literature for distribution to laymen will be supplied to veterinarians on request. Please state the quantity you need.

PITMAN-MOORE COMPANY

Pharmaceutical and Biological Chemists
Division of Allied Laboratories, Inc.

INDIANAPOLIS 6, INDIANA

1. United Press Dispatch, Austin, Minn., April 6, 1950.
2. Eveleth and Goldsby: Vet. Med. 14:115-118 (1919).

Ready for Immediate Mailing . . .

1950 AVMA DIRECTORY

. . . The Best and Most Complete Veterinary Directory Ever Published

■

SPECIAL PRICE TO MEMBERS — $2.00
PRICE TO NON-MEMBERS — $10.00

■

Here are just a few of the twenty-five special features of the 1950 DIRECTORY:

● Names of 14,000 veterinarians with addresses and professional data, including all AVMA members and over 4,000 non-members ● Digests of practice acts ● Comprehensive information about colleges of veterinary medicine, both American and foreign, and veterinary science departments of land-grant colleges ● Complete organization and personnel of federal, state, and provincial government veterinary services in U.S. and Canada ● Secretaries of state, territorial, and provincial associations ● 288 pages.

USE THIS COUPON TO ORDER YOUR COPY TODAY

AMERICAN VETERINARY MEDICAL ASSOCIATION
600 S. Michigan Ave., Chicago 5, Ill.

I enclose $ ..... for ..... copies of the AVMA Directory.
(Price: $2.00 to members; $10.00 to non-members)

Please Print

NAME .....

ADDRESS .....

.....

ORDER BLANK

Friskies

Authoritative information on the scientific care and feeding of dogs. Published by Albers Milling Company (a division of Carnation Company) under the supervision of Dr. E. M. Gildow, B.S., M.S., D.V.M., Director of Research.

No. 2

DOG RESEARCH NEWS

Dogs vs. Human Nutrition

Prior to the advent of commercial dog food, dogs usually ate the same food as their owners – scraps from the table, and soup bones from the butcher. A study of the nutritional disturbances of dogs on these diets also shows that they suffered from most all the nutritional disturbances (scurvy excluded) affecting humans!

Extensive research indicates that these nutritional deficiency disturbances in dogs were not caused by poor digestion of the nutrients, carbohydrates and fats—*but by a lack of balance of essential nutrients in the diet!*

Albers has pioneered in developing food for dogs that corrects this lack. Friskies is not only nutritionally *complete*—it is a *perfectly balanced* combination of every food element a dog is known to need.

Fat Adds Palatability

If the ingredients of a commercial dog food are fed in separate pans, the dog will usually eat the fat first — *even before the meat portion!*

But how much fat should be in a complete dog food? Excessive amounts will reduce the total amount of food eaten for normal condition, and thus restrict the balance of nutrients consumed. Actually, dogs thrive on diets very low in total fat.

The amount of fat in Friskies is the result of extensive palatability trials, and nutrition tests covering generations of dogs of all breeds. Friskies provides the correct proportion of fat to (1) aid in the digestion of protein; (2) increase palatability; (3) help the assimilation of fat soluble vitamins; and (4) provide high energy value.

"Hot Spots"

Dermatitis, eczema – or in the dog man's language, "Hot Spots"—is a constant problem. Friskies Research Kennels has prepared a complete analysis and review of the subject. Write for a copy.

What's Your Question?

DR. E. M. GILDOW

Send your questions about dog breeding, feeding and care to Friskies Research Kennels, Carnation, Washington. The knowledge gained during 17 years of scientific research is yours for the asking.

NO SUPPLEMENTS NEEDED WHEN YOU FEED

Friskies

• A COMPLETE DOG FOOD •

5 Sizes: 50, 25, 10, 5, 2 lbs.

A FRISKY DOG IS A HEALTHY DOG

NOW MASTICS® *with* STREPTOMYCIN

PENICILLIN-STREPTOMYCIN BOUGIES

FOR THE TREATMENT OF *STUBBORN* MASTITIS* CASES

The new MASTICS *with Streptomycin* contain 25,000 units of penicillin "G" *plus* 25 mg. of streptomycin—two time-proven drugs that cure most stubborn mastitis cases.

Inserted in the infected teat, they dissolve and medicate all parts of the teat lining, cistern and large ducts. They come individually sealed in a foil wrap which serves as an applicator.

Order either MASTICS *with Streptomycin* or the familiar Penicillin MASTICS from your distributor. If he cannot supply you, send your order to us. Delivery charges prepaid if check accompanies order, otherwise C.O.D. plus charges.

MASTICS ADVERTISING IN 15 DAIRY FARM PAPERS SENDS THE HERDOWNER TO YOU

Don't be limited to ONE drug in the treatment of MASTITIS*

Get the new MASTICS® with *Streptomycin* and you get the following unusual advantages in the treatment of mastitis.

1. Broadest coverage—Mastics with *Streptomycin* combine the action of 25,000 units of penicillin "G" plus 25,000 mcg. of streptomycin, two proven leaders that cure most stubborn mastitis cases.
2. More economical—No expensive tubes, cannula or caps to discard. The entire dose is inserted in one operation, none remains in tube.
3. Freely soluble—Mastics with *Streptomycin* completely dissolve in the milk; do not float on top like greases and ointments. No greasy deposit remains in the milk after treatment.
4. Excellent results—96.6% cures authoritatively reported.
5. Easy to insert—Tapering ends dilate the teat opening by easy stages. Smaller diameter and absence of rough edges make insertion painless.
6. No breakage—Mastics with *Streptomycin* are flexible, seldom break—never crumble.
7. Lowest cost—Materials used are well past the expensive developmental stage. Large available supplies mean low factory cost.

Get either MASTICS with *Streptomycin* or regular Penicillin MASTICS from your veterinarian—no one else is so well qualified to advise you in their use. If he cannot supply you, send us his name and address.

*caused by Strep. agalactiae, B. coli, Aerobacter aerogenes.

The Martin Laboratories
West Chester, Penna.

Regular MASTICS

25's	$ 4.00
100's	$15.00
500's	$65.00

High Potency MASTICS

25's	$ 7.50
100's	$28.00

MASTICS *with Streptomycin*

25's	$ 4.75
100's	$18.00

"Mastics" Reg. U.S. Pat. Off.

The Martin Laboratories
West Chester, Penna.

distemperoid*

A THERAPEUTIC AGENT IN THE EARLY STAGES . . .

Your canine patient with distemper now has much greater chances for recovery if healthy body cells have not suffered excessive damage. Restoration to health depends on checking the distemper virus with an "interfering agent."

Your best weapon and interfering (cell blocking) agent is Distemperoid — Ferret Origin, Green Method — in proper dosage.

Administration of 2 mg. per pound of body weight, but never less than 25 mg. as a SINGLE INJECTION will block further progress of the disease. If not too great damage has taken place, your canine patient can recover.

- ***Send for your free booklet "Treatment and Prevention of Distemper"***
- ***Supplied in single-dose and 10-dose packages***

* ***A modified live nonpathogenic distemper virus producing rapid immunity in dogs***

FROMM

CANINE DISTEMPER VACCINE

FROMM LABORATORIES, INC.
Grafton, Wisconsin, U. S. A.
Telephone Cedarburg 811

sole distributors:
WINTHROP-STEARNS, INC.
170 VARICK STREET
NEW YORK 13, NEW YORK

Looking Forward

with Veterinary Science

The international unity of hunger and disease in animal and man makes the range and influence of the veterinarian boundless.

Much of man's food depends upon the veterinarian and the comparatively few who, through professional handling in the production and distribution as well as in the administration of biologics, make veterinary science more secure.

Corn Belt, the *veterinarian owned company*, through the years, has charted the way.

CORN BELT LABORATORIES, INC.

The Veterinarians' Institution - Established 1913

EAST ST. LOUIS, ILLINOIS

AT LAST! for RINGWORM

a POWERFUL non-irritating FUNGICIDE*

NAPRYLATE

brand of CAPRYLIC COMPOUND

. . . bacteriostatic as well as fungicidal. Doctor and owner alike welcome the convenience, speed and efficacy of *Naprylate* . . . today's most powerful ally in the battle against fungus infections of the skin and mixed bacterial invasion. Stainless in all forms. *Literature supplied with your order upon request.*

* *Keeney, E. L. and associates. Bull. Johns Hopkins Hospital 77:422, 1945*

NAPRYLATE *liquid* . . .

. . . convenient for penetration on hairy surfaces.

Sodium Caprylate	20%
2 oz. Pints	Gallons

NAPRYLATE *ointment* . . .

. . . non-greasy, water miscible base.

Sodium Caprylate	10%
Zinc Caprylate	5%
¾ oz. Tubes	1 lb. Jars

NAPRYLATE *powder* . . .

. . . for drying up "weepy" areas and for prophylaxis.

Sodium Caprylate	10%
Zinc Caprylate	5%

2 oz. Sifter Top Cans
18 oz. Sifter Top Cans

STRASENBURGH Co.
Pioneering in Veterinary Pharmaceuticals Since 1886
ROCHESTER 4, N. Y.

Armour holds many patents – for your protection!

Armour products are sold to graduate veterinarians only

Radio sells your services to farmers!

Bismarck, N. D.	KFYR
Chicago, Ill.	WMAQ
Columbus, Ohio	WAKC
Creston, Ia.	KSIB
Fargo, N. D.	WDAY
Fort Dodge, Ia.	KVFD
Grand Island, Neb.	KMMJ
Great Bend, Kan.	KVGB
Marshfield, Wis.	WDLB
Mitchell, S. D.	KORN
Springfield, Mo.	KWTO
Woodward, Okla.	KSIW

These are some of the radio stations which have carried frequent messages as part of Armour's extensive radio and farm paper campaign urging farmers to seek your expert help in disease prevention and disease control. As a major buyer of farm livestock, milk, eggs and poultry, we *know* hit-or-miss diagnosis and "home remedies" are costly and inadequate.

Order your veterinary supplies from your Armour salesman. For price lists and information, write to: Armour Veterinary Laboratories, KAW Station, Kansas City 18, Kansas.

ARMOUR

VETERINARY LABORATORIES

KAW STATION • KANSAS CITY 18, KANSAS

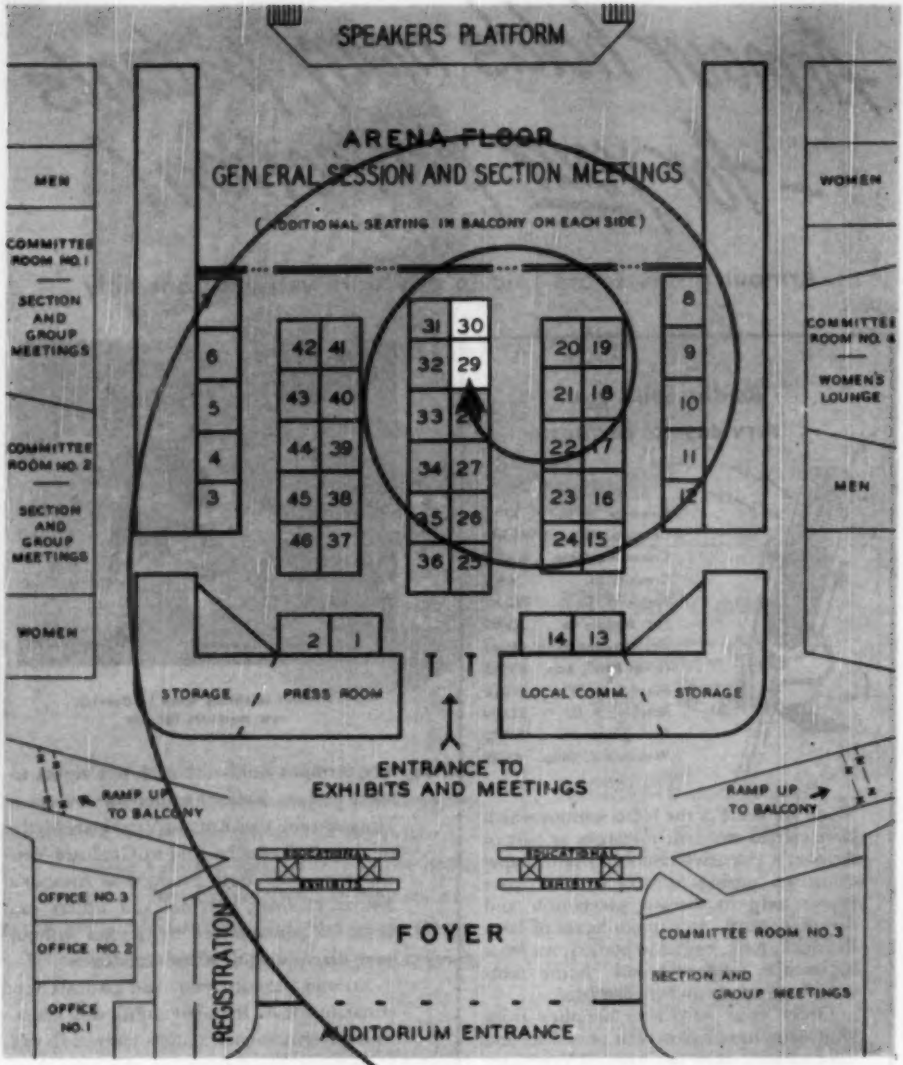
PRODUCER OF ARMOUR ANTI-HOG CHOLERA SERUM

Armour scientists work to develop new products for you

Yes, Armour holds the exclusive rights to many patents—holds them for *your protection*. Thus assuring that Armour Veterinary Medicinals will always be sold to Graduate Veterinarians only. Such products as Armour's Avinar, Bovinar, Porcinar and others can never be administered by farmers without your diagnosis and recommendations.

Armour supports you—the graduate veterinarian—with frequent radio and magazine advertisements...urges farmers to call a graduate veterinarian as the man best qualified to treat and prevent animal disease.

By selling quality veterinary medicinals to graduate veterinarians only, Armour helps you cut down the staggering losses caused by diseased livestock. When you order veterinary medicinals from an Armour salesman, you are doing business with a company that has a large interest in preservation of livestock health.



See you in Miami Beach!

During the AVMA meeting, we hope you will include a visit to Fort Dodge in Exhibit Spaces 29 and 30.

FORT DODGE

Journal
of the
American Veterinary Medical Association

Copyright 1950 by American Veterinary Medical Association
600 S. Michigan Ave., Chicago 5, Ill.

VOL. CXVII AUGUST, 1950 NO. 881

The Veterinarian's Responsibility to His Community

A. L. MacNABB, D.V.M.

Guelph, Ontario

VETERINARY medicine, like human medicine, as an art is old, but as a science is relatively new. Organized veterinary medicine commenced at Lyons, France, 190 years ago. The first American veterinary school was opened in New York ninety-seven years later, and it was not until 1862 that such a school was opened in Canada, at Toronto, Ontario. However, during the short time that the profession has been on an organized basis, the progress made has been noteworthy. The profession has justified its position among related sciences, and has proved itself by contributions to communities on the North American continent as well as in Europe.

Through the efforts of those engaged in the study and practice of veterinary medicine, we in North America have surmounted the first obstacle in animal disease control—the successful eradication of lethal diseases such as cattle plague and bovine pleuropneumonia. We are passing through what might be called the second phase—the eradication of the more chronic diseases such as tuberculosis and contagious abortion. We now face the third problem—that of finding preventive and corrective measures for nutritional and metabolic disorders.

It is with considerable pride that we can review the contributions made by veterinarians. In France, Ramon's simple observation in his work with chicken cholera led to the production of anatoxin Ramon, or diphtheria toxoid as it is known in this country. Guérin, in association with Calmette, was responsible for an important step in the evolution of BCG vaccine, the use of which has now reached popular proportions in the immunization of human contacts and of those whose duty it is to be in intimate contact with tuberculosis cases. Such a contribution is of great importance.

National organizations, such as the U.S. Bureau of Animal Industry in Washington, D.C., and the Canadian Health of Animals Branch of the Dominion Department of Agriculture have instituted and maintained vigilant disease-control programs. Their records show that, in 1918, there was approximately a 5 per cent positive reaction among cattle for tuberculosis, as compared with 0.2 per cent for the past year. We are also proud of the accomplishments of the U.S. Army Veterinary Corps in the field of food control during World War II, and of the excellent work done by the Bureau of Animal Industry in the control of foot-and-mouth disease in Mexico.

Marked progress has been made in connection with vaccine therapy. Using strain 19 *Brucella abortus* vaccine for calfhood vaccination, we have made significant progress in effecting a reduction in the incidence of brucellosis. The advances made in biological therapy against canine distemper and the evolution of vaccine for the active immunization of chicks against Newcastle disease have been contributions of national significance.

In addition, the veterinary profession has done much for society, in general, by

Since Dr. MacNabb was unable to be present at the meeting of the Illinois State Veterinary Medical Association, Feb. 1-3, 1950, Peoria, this paper was read by Dr. F. W. Schofield.

conducting programs of milk control and mastitis control, and programs designed to lower the incidence of animal diseases transmissible to man. The human mortality due to bovine tuberculosis infection decreased from 22.5 per 100,000 in 1917 to 3.5 per 100,000 in 1942, a reduction of 84 per cent.

There has been increased awareness, within and without the veterinary profession, of the importance of animal health and the place it occupies in the national economy. Marked changes have been made in the approach to, and the maintenance of, animal health. Improvement of nutritional methods, selective breeding, and suitable environment have all been accorded increased recognition.

All this attention to animal health has resulted in a definite diminution in the mortality due to disease, and hence has been a marked benefit to the community. The standard of living of the whole agricultural community has been increased to an extent which would not have been possible had not the veterinary profession so ably performed its duty.

Further study on the part of veterinarians is necessary. They must utilize the discoveries of men in other fields in such a way as to benefit not only animal but also human health. In recent years, over 5,000 sulfonamide drugs and more than 200 antibiotic agents have been evolved. While only a few of these are used in human or veterinary medicine, it is important to remember that a comparative study should not be limited to the human aspect of the study of diseases of animals communicable to man. Morbid conditions should be viewed from the lowest form of life to the highest so that the factors common to all living cells and peculiar to some may be revealed.

One often wonders, "What are the factors involved in susceptibility or disposition of men and animals to infection?" Apparently, it does not depend on species, but even races and individuals within a race are affected. For example, man and the horse are not infected by *Clostridium chauvoei*, whereas the disease causes heavy losses in young bovine animals. On the other hand, poliomyelitis has only one natural host, whereas rabies has several.

In recent years, important knowledge has been obtained relative to glandular activity, and the functions and practical application of the knowledge of such glands as the anterior pituitary and the adrenal cortex with its 28 hormones thus far identified have been established. The implications of histamine release have been studied. These discoveries call for diligent work on the part of the veterinary profession, so that its members may further their knowledge and broaden the application of each new finding.

If veterinarians do not take advantage of the opportunities in research which confront them, some of the functions rightly the concern of our profession may pass into other hands. It is up to us to accept the challenge, particularly in the field of biological chemistry.

Although important contributions have been made by our profession, certain forces operate somewhat to the detriment of the cause of veterinary medicine. I refer first to certain individuals who feel that veterinarians are not qualified to play a part in public health programs. There are too few veterinarians in that field, and too many individuals other than veterinarians engaged in various aspects of food control, aspects which are rightly the duty of the veterinarian.

A second handicap from which veterinarians have suffered is a lack of adequate publicity. In the past, too little attention has been given to public relations. The American Veterinary Medical Association is to be congratulated for the great progress which has been made in providing radio programs and news items. It is hoped that all members will use these, for they serve a very important purpose.

A third factor working against the interests of the veterinarian is the individual who relies on all types of home remedies, and who neglects to consult a veterinarian until the patient is moribund. This failure can be corrected by improving relations between veterinarians and animal owners.

There are other ways in which we can improve our standing. Veterinarians on this continent number approximately 15,000, yet only 10,000 are members of the American Veterinary Medical Association. This condition should be improved; we must strive to increase our membership. As a united group, we shall grow stronger.

Moreover, as members of a community, we must not be satisfied by restricting our

activities to veterinary medicine alone. A broadening of interest is essential. I am sometimes amazed at the indifference shown by presumably educated men concerning fields of knowledge other than those with which they are directly concerned. These people give the excuse that they are not familiar with the complexities involved and hence can have no interest in the subject. It should be remembered that one does not need to comprehend the side-chain theory and the details of atomic fission to understand the implications and possible applications of atomic energy.

The growth of occupations into professions is a social phenomenon. The first and basic step in the process is the development of a tested body of knowledge upon which the skill of its members rests. Beyond this framework, skilled practitioners use the same tools of thought as mechanics. Later, the profession acquires the dynamics of group behavior. At this stage, ethical practices must be given primary consideration if an occupation is to attain the professional level desired. The veterinary profession is in this stage, and it is up to us to promote its growth and increase its prestige, by raising the ethical standards wherever possible.

Two levels of activity are necessary if our profession is to serve the community in a competent manner. First, we must maintain adequate research staffs and facilities, and secondly, we must recognize the paramount importance of the observations and recommendations of practitioners in the field and of faculties in professional schools.

By a high quality of performance, our profession can carry out the responsibilities which are its obligation. We must have a sense of professional relationship. When an organization is functioning well as a unit, the coöperative individual usually becomes adjusted, but when that organization endeavors to provide a pulmotor, the effect will be short-lived. Therefore, an authoritative leadership, combined with hard work and conscientious desire for service on the part of each and every one of us, will ensure that our profession will fulfill its mission.

And what of veterinary education—the production of future veterinarians? More than 3,500 students attend the schools of veterinary medicine in Canada and the United States.

It has become increasingly apparent that the cultural or humanitarian subjects should be blended with the technical subjects in a science course. This is not entirely a new concept; our educational traditions, which call for emphasis on the humanities, are derived from various schools of Great Britain and western Europe. In recent years, insufficient time has been devoted to the cultural subjects. Although a student who enters a school of veterinary medicine does so in order to receive the basic instruction necessary for the practice of veterinary medicine, efforts should also be made to teach him to reason, analyze, and constructively criticize, so that he can make a gainful living in other occupations if necessity arises.

This balance of interest and training is essential to a well-rounded education. Lord Greene said, "A race that knew and cared for nothing but science and its practical application would become as soulless and mechanical as a formula; just as a race which cared for nothing but the humanities would end in dreams."

Great strides have been made in formal education in recent years. On the North American Continent, there are more than 4,000,000 university graduates today. Last spring, 150,000 young men and women, members of the class of 1949, graduated from our North American universities — the largest number ever to do so. Such opportunities were made possible only through sympathetic forms of government and our democratic way of life. We have a freedom of education not possible under any other form of government.

The meaning of freedom is difficult to express; it may be described as a willingness to acknowledge law and discipline. It implies the right to change one's mind. The price of freedom is constant vigilance — vigilance over thoughtless impulses. When we apply our knowledge in the proper direction, it becomes wisdom. It is the duty of all schools today to provide young men and women with the groundwork of their education so that they will be able to use the fundamental principle of self-regulation, and acquire a tolerance and appreciation of another's viewpoint. The objective of any school, be it of veterinary medicine, law, agricultural science, or engineering, is the propagation of literacy, understanding, and moral integrity.

There are those who say that education is dangerous. It is true that in the last fifty years there have been several major wars averaging four years in length, and that 33 per cent more people have been killed in a thirty-year period than during the previous 800 years. However, this state of affairs was caused by rulers in autocratic forms of government, and any loss sustained by peoples of democratic countries has been in self-defense. Canada and the United States believe that a *lack* of knowledge is dangerous, and we have been striving to ensure that illiteracy is on the decrease on this continent.

Veterinary medical education and its application has no geographical boundaries; it is universal. We must perform our task with a spirit of tolerance and brotherhood, ensuring that the best of scientific methods are used. Veterinary medicine's great mission is to contribute to the well-being of the peoples of the world — materially, sociologically, and spiritually. It has been said that we live in a world more starved for friendship than for food. Each of us must be willing to ring doorbells for causes which we believe to be right, no matter how insignificant they appear. Those of us connected with veterinary colleges must pledge ourselves to instill into our students a desire to build a better world, and a recognition of spiritual values.

Basking Ridge Small Animal Hospital

Basking Ridge small animal hospital, owned and operated by L. R. Barto, V.M.D. (UP '30), is located on King George Highway at Basking Ridge, N. J., on a tract of 3¾ acres.

The first floor consists of a reception room, examining room, powder room, drug room and laboratory combined, utility and transient kennel room combined, three kennel rooms, kitchen, an inside exercise room, and boiler room. The floors are of terrazo. The walls are of sheet rock and painted pastel shades, with natural woodwork trim.

An isolation unit is separated from this part of the hospital by a two-car garage, but both units are heated from a single plant, although with individual thermostats.

The second floor of the main part of the hospital contains a surgery, x-ray room, a

Fig. 1—Residence (left) and hospital of Dr. L. R. Barto, which is situated in Basking Ridge, N. J., on the King George Highway.

study or office, a bedroom and bath for resident kennelmen, along with dark room and storage space.

Upon graduating from the University of Pennsylvania School of Veterinary Medicine in 1930, Dr. Barto served as junior resident veterinarian at the university hospital clinic. From 1932 to 1934, he was associated with Dr. J. B. Engle at Summit, N. J. Then followed eleven months of clinical study and visits at 19 schools of veterinary medicine in 14 European countries. Four months of this time were spent in Berlin with Prof. W. Hintz, ten weeks in Vienna with Dr. Alois Pommer and Prof. David Wirth. Dr. Barto spent two additional years with Dr. Engle, after which he established his own practice in October, 1937. The present hospital building was completed in August, 1948.

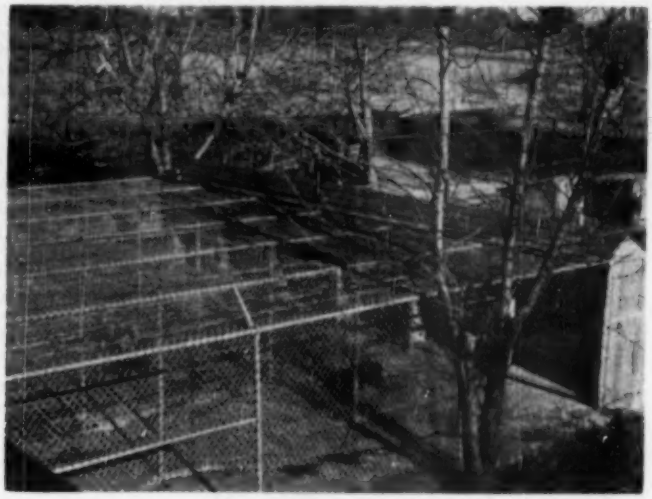


Fig. 2—The exercise yards and grounds at the rear of Dr. Barto's hospital in Basking Ridge, N. J.

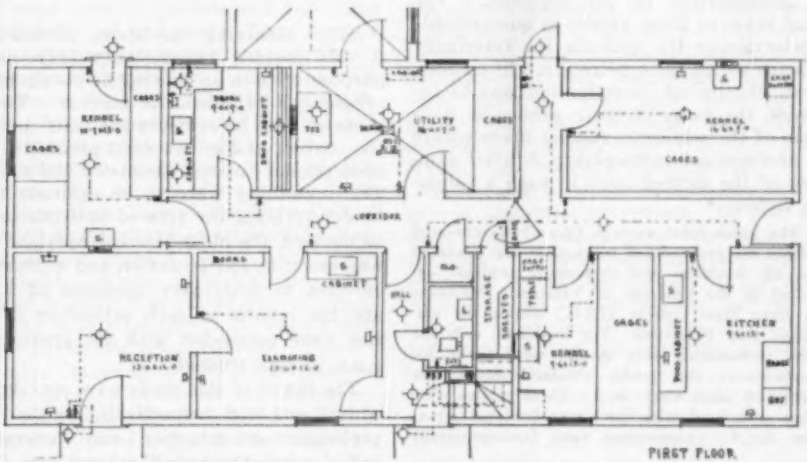


Fig. 3—First floor plans of Dr. Barto's hospital in Basking Ridge, N. J.

The Development of an Aptitude Test for Veterinary Medicine

LOYAL C. PAYNE, D.V.M.

Ames, Iowa

THE VARIOUS schools of veterinary medicine in North America have been able to enroll, within the past decade, only a certain percentage of the applicants desiring admission. With this situation existing, it has been necessary to screen and select the applicants who are best qualified for training in veterinary medicine. The increased emphasis which has been placed upon the importance of such a selection has resulted in a careful reëxamination of selection procedures and has suggested the possible utilization of some type of veterinary aptitude test.

Accordingly, the problem of the present investigation has been to discover or develop an efficient test which will not only predict scholastic success during the first professional year but will also determine, to some extent, the ability which the applicant possesses for veterinary medicine. At the present time, high school scholastic average, the preprofessional college average, and scores made on the American Council on Education (A.C.E.) psychologic examination are being used in determining the qualifications of the applicant. The actual value of these grades is questionable in determining the aptitude for veterinary medicine which the applicant might possess. Hence, the initial investigation was to determine the value of these grades as indicators of the scholastic success made within the professional curriculum. A brief summary of the method used in such a validation follows:

The grade-point average (g.p.a.) accumulated within the professional curriculum was obtained for all freshmen and sophomore students enrolled in the Division of Veterinary Medicine of Iowa State College (I.S.C.) during the academic year 1947-1948. For freshmen, only the first professional year grades were used; for sophomores, the grades obtained during the first two years were used. These grades were then correlated with the preprofessional g.p.a., the A.C.E. examination raw (uninterpreted) scores, and the grades obtained by each student in the courses which were required previous to his entrance into the professional curriculum, *i.e.*, chemistry, zoölogy, English, and botany. A total of 133 students was included in this study.

The results of this analysis proved that none of the above was a satisfactory predictor of academic success. The correlation (r) of the total professional grades and total preprofessional grades gave an r of 0.40 (1.00 representing a perfect correlation). The correlations of the professional g.p.a. with English and botany were insignificant. The correlation of the professional g.p.a. and preprofessional chemistry gave an $r = 0.47$, and between professional g.p.a. and preprofessional zoölogy gave an $r = 0.41$. The correlation between professional g.p.a. and the raw scores of the A.C.E. examination was $r = 0.02$.

TABLE I—Correlations of Existing Indicators with Freshmen Veterinary Grade-Point Averages*

Total preprofessional average	$r = 0.40$
Preprofessional chemistry average	$r = 0.47$
Preprofessional zoölogy average	$r = 0.41$
Raw score on the A.C.E. examination	$r = 0.02$

*Number of students studied—133.

After obtaining the above correlations, it was decided to construct four special purpose tests in an attempt to obtain better predictions of scholastic success. Two of these were to be achievement tests covering the content of the two most predictive preprofessional courses, chemistry and zoölogy. The remaining were to be aptitude tests. In determining the type of aptitude test to be devised, the Moss Medical Aptitude Test was given to 133 freshmen and sophomores enrolled in veterinary medicine at I.S.C., and the results of each subsection of this test were correlated with the professional g.p.a. of each student.

The result of this study gave correlations of 0.22 and 0.38, respectively, for the "comprehension and retention" and "understanding of printed material" subsections. Other subsections which showed a small or nega-

Assistant professor of veterinary physiology, Iowa State College, Ames.

tive correlation were visual memory, memory for content, general information, vocabulary, application of principles, and logical reasoning. It was decided to develop a veterinary aptitude test similar to the two sections of the Moss test which gave the highest correlations.

The first aptitude test developed was a reading test called "paragraph comprehension." After reading standard printed material, the student is asked to answer several questions. The original material is available to the student while he answers the questions, but is on the reverse side of the page. The second test was designated "verbal memory" and involves a timed study of standard selections with a subsequent objective test based upon the individual's ability to accurately recall material which he has read.

Both of these tests are entirely new, and the content of each was judged by members of the staff of the School of Veterinary Medicine at I.S.C. to be representative of veterinary medical material. The usual psychometric procedures relative to establishment of time limits, analysis of items, and general revision were employed. It should be noted here that none of these test results has been employed in the selection of applicants in any college and that the data are, therefore, uncontaminated. With the development of the two achievement tests and the two aptitude tests, subsequent classes enrolled in veterinary medicine at I.S.C. were used to validate and determine the reliability of each test. The four test scores were combined into a single index by a statistical procedure designed to yield approximate weights. The four subtests together have been designated as the I.S.C. veterinary aptitude test (v.a.t.).

To determine the actual value of this test, three other schools of veterinary medicine (New York State Veterinary College at Cornell University, Kansas State College, and Michigan State College) were asked to coöperate. These schools administered the tests to about half of the eligible applicants who were attending those schools during the 1948-1949 academic year. The results were returned to I.S.C. for analysis.

The criterion adopted for the evaluation of the v.a.t. was that of academic success during the first semester or the first two quarters of the professional training. The total g.p.a. for this period was employed because such an average correlates highly with the total g.p.a. within the professional years, and because it seemed to be the longest "waiting interval" in the study compatible with the urgency of the case. As these data were received from the coöperating schools, each student's g.p.a. was assigned a standard score value, and this value placed in a distribution for the school from which it had been obtained. The g.p.a. for the first semester or first two quarters in the professional year for each student was then correlated with the score that the student obtained on each section of the v.a.t. and with the total score on the aptitude test. Other statistical analyses were made according to psychological testing methods.

The results of the evaluation of the high school g.p.a., preprofessional g.p.a., and the A.C.E. examination have already been given. The correlations between each of the four newly constructed tests and the freshman veterinary average are given in table 1. It may be noted that the achievement test does not correlate nearly as high as do the aptitude sections of the test. The achievement test has been retained because it is recognized that, in the selection process at I.S.C., emphasis is placed upon the preprofessional g.p.a. of the candidate. By giving all applicants the same achievement test, any great difference in their preprofessional background will be evidenced. The fact that the men, enrolled in the coöperating schools, who took the test ranked much higher in g.p.a. within the total class than those who did not take the aptitude test indicates that their background may have been superior. The vast difference in grading systems between the various colleges can be narrowed by giving all applicants one common examination.

Subsequent to the administration of this test in the different schools, the two sections of achievement were rigorously item-analyzed; *i.e.* each question was evaluated according to its contribution to the total, the poor items were discarded, and the remaining questions placed in order of their difficulty, the two sections being combined into one shorter test.

With the purpose of predicting academic success within the curriculum of veterinary medicine, the final aptitude test was evaluated as follows: The scores of all students (150) within each school which re-

ported grades (4) were listed on the basis of the total score made on the v.a.t. The students from each school and the total number of students were then divided into two equal groups. It was assumed that academic success would mean the student was listed within the upper half of the total class. If a cutting score is placed at a total score of 83, the v.a.t. will predict that 75 per cent of the men below 83 will not succeed in veterinary medicine. Actually, 24 per cent of the men below a score of 83 per cent do succeed. Likewise, above the cutting score of 83, 57 per cent of the cases will succeed in veterinary medicine and 43 per cent of the cases will not. It is readily seen that this test is more successful as a predictor of failure than of success. As yet, no test has been devised which will predict whether a man will graduate from any course. The ambition of the student, his willingness to study, and other outside interests which interfere, all affect his g.p.a., and no test will predict these factors. The I.S.C. test will predict whether the man possesses the *ability* to succeed in veterinary medicine. Many men who possess the ability to succeed, fail; whereas, very few men without the ability do succeed. It is this latter group we are trying to determine.

If we can predict within a class that all men will succeed, we will naturally cut out some of the men who would have succeeded had they been accepted; but we have not accepted any men into a school who would have failed. Because the range of the test correlation with grade-point averages at the different schools was from 0.50 to 0.70, it is impossible to predict 100 per cent of the cases accurately.

The original I.S.C. v.a.t. included one section entitled "animal interest" which was given to the students in the four different colleges. However, the low correlation of this test with the g.p.a. indicated that it should not be used as a predictor of failure or success. The test was based on the assumption that if a student is really interested in animals early in life, he will acquire many small points of interest about them. It was made up of 35 questions similar to the following examples: (1) Which of the following animals does not possess a cloven hoof (bovine, caprine, ovine, equine)? (2) What is the number of upper incisor teeth in the bovine animal (one, four, six, none)? (3) What is the number of true stomachs in the cow (one, two, three, four)? The correlation between the farm background and the total score on the test indicated that farm life was a valuable asset to the applicant, but did not necessarily indicate his scholastic ability. Because of this, it was decided to use the animal-interest subtest as a part of the personnel data which the applicant is required to supply.

Further studies of each part of the v.a.t. may reveal that certain parts are much more valuable in predicting academic success than others. Because of the small number of cases studied, these parts have been retained only tentatively. Of course, constant revision of the entire test is essential. As an example, the paragraph-comprehension test, measuring ability to read and interpret typical veterinary content, is an excellent predictor of academic failure (table 2).

TABLE 2—The Frequency of the Scores of the Predicted Failures (F) and Successes (P) on the Paragraph-Comprehension Subtest

30	32	34	36	38	40	42	44	46	48	50	52	54	56	58
F	F	F	F	FP	FP	FP	FP	FP	F	FP	FP	FP	FP	P
F	F	F	F	F	FP	FP	FP	FP	FP	FP	FP	FP	FP	
		F	F	F	FP	FP	FP	FP	FP	FP	FP	FP	FP	
			F		F	FP	FP	P	FP	FP	P	FP	P	
					F	FP	FP	P	FP	FP	P	FP	P	
					F	FP	FP	P	FP	FP	P	FP	P	
					F	FP	FP	P	FP	FP	P	FP		
					F	F		P	FP	FP	P	FP		
					F	F		P	F	FP	P	FP		
					F	F		P	F	FP	P	FP		
					F	F		P	F

ference placed upon scholastic success as compared with aptitude for veterinary medicine in the various schools. Some schools emphasized scholastic success as being 20 times as important as aptitude, whereas other schools placed equal weight on both achievement and aptitude. Thus, it can be seen that, among the schools studied, there is a large variation in the method of selection. Such a test as the v.a.t. should tend to level off the variance among schools, if it were a universal requirement.

It is clear that an aptitude and ability test would be helpful in eliminating some of the students who will make below average academic records. The use of such a test will not result in the elimination of all such students, but it will make it possible to screen out a considerable number of them at the expense of an occasional potential success.

It is, of course, essential to recognize the fact that these new tests are only an aid in the selection of veterinary students, and that the scores made on the test should be used as a part of, and along with, the usual selection procedures. If they are so used to increase the efficiency with which professional candidates are selected, the results should be fewer academic failures, easier and more efficient instruction, and better veterinarians in the future.

Veterinarians in Public Health Work

Rabies was controlled among the wild animals in New York State by reducing the fox population. This was done through the help of professional trappers who worked seven days a week in certain areas. This program has definitely reduced the livestock losses linking them still more closely with rabies in wild life.—*A. Zeissig, D.V.M., New York.*

• • •

The atom bomb will cause damage through the blast and heat factors more readily than through the radioactive dust and the clouds set up by the explosion. The latter are more important in underwater blasts.

Fission products usually are not absorbed from the digestive tract, but are readily absorbed by inhalation. Once the fission products are captured by the tissues, they are very difficult to dislodge. The first problem of a veterinarian in the event of an atom bomb explosion probably would be the treatment of burns, blast damage, etc., rather than conducting the Geiger test on food and engaging in decontamination activities. The radioactive substances are much more likely to be abundant in the bones than in the muscle tissue.—*A. H. Wolff, D.V.M., Washington, D. C.*

• • •

A state meat-inspection program should be voluntary in its early stages. Legislation can help, when many local agencies are participating and will help to enforce the legislation. All work of this nature should be under the administrative or direct supervision of a licensed veterinarian employed by the local agency of government.—*M. D. Baum, D.V.M., Colorado.*

• • •

Accurate and reasonably complete reporting is necessary to achieve and to maintain control of animal diseases and especially those transmissible from animals to man. War tends to break down an effective reporting system because it speeds up travel and increases world trade in animals and animal products. The breakdown of inspection and of reporting results in a rapid and a wide spread of many diseases.—*W. T. S. Thorp, D.V.M., Washington, D. C.*

• • •

The formation of specific Brucella agglutinins after an intradermal test is an anamnestic reaction, and it occurs in only one third of those individuals sensitive to Brucella. Among 100 patients, not a single one with a negative intradermal test had developed agglutinins for *Brucella abortus*.—*C. M. Carpenter, D.V.M., M.D., California.*

• • •

The Brucella ring test was used satisfactorily and with reliable findings on shipped milk samples with or without added preservative. It probably will prove to be an adequate screening test and a means of early determination of reinfection of negative herds, thus reducing the amount of blood testing needed in such herds.—*A. V. Hardy, M.D., Florida.*

Excerpts from talks presented at a meeting of veterinarians interested in public health work held in conection with the meeting of the American Public Health Association, New York, Oct. 24-28, 1949.

Cysticercosis and Trichinosis

Of all human diseases that are caused by parasites infecting animals and man, cysticercosis and trichinosis are two of the most common. Both infections are the result of ingesting the causative parasite in infected meat. Meat inspection as conducted by the Meat Inspection Division of the U. S. Department of Agriculture is an efficient safeguard against cysticercosis in beef. Because trichinosis is caused by a nematode parasite that is microscopic in size, the federal meat inspection service makes no inspection for the presence of trichinae in fresh pork. All fresh pork should be thoroughly cooked before being eaten as trichinae are readily destroyed when subjected to a temperature of 137°F. Federally inspected pork products customarily eaten without cooking, as certain sausages and hams, are perfectly safe as the pork muscle in these products has been processed to destroy any trichinae that may have been present in the fresh pork. Since about 30 per cent of the meat and meat products that are consumed in the United States do not receive federal or comparable inspection, these two diseases, cysticercosis and trichinosis, continue to present a real problem.

Since the treatment of people having cysticercosis and trichinosis has not been successful, the emphasis must be placed on prevention. A complete understanding of the life cycles of the parasites and how the infections in animals and man can be prevented will materially aid in reducing the incidence of these diseases.

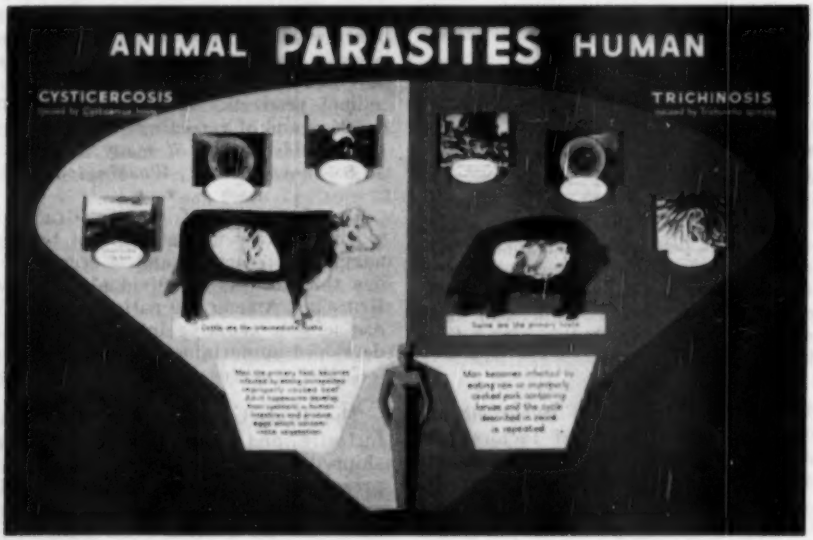
Prepared by the Scientific Exhibits Committee of the American Veterinary Medical Association.

CYSTICERCOSIS

Cysticercus bovis is the larval form of the parasite causing cysticercosis. It is the intermediate stage of *Taenia saginata* which lives in the human intestine. The larval form or cysts are found in hind limbs, liver, heart, lungs, diaphragm, tongue, and other voluntary muscles of the bovine animal.

The parasites in the cow appear as small spherical bladder worms about 9 to 5 mm. They are white or gray, with a small yellowish spot which is the invaginated unarmed scolex.

Life Cycle.—The proglottides containing eggs are produced by the adult tapeworm in man and are expelled in the feces. Cattle ingest the eggs that are deposited in pastures, feedlots, or on vegetation. After the eggs are ingested by cattle, the onchospheres (six-hooked embryos) are released. The embryos penetrate the intestinal wall, get into the lymphatic system or blood vessels, thence to the heart and are circulated to the intramuscular connective tissue. The embryos mature into cysts in six to eighteen weeks. Prenatal infection has



Center panel of the exhibit on cysticercosis and trichinosis shown at the American Medical Association convention in San Francisco, June 26-30, 1950. The exhibit was prepared by the Scientific Exhibits Committee of the AVMA.

been reported in calves. When the cysticerci are eaten by man, the bladder and cyst wall are digested and the scolex attaches to the intestine and develops into an adult worm (*T. saginata*) in eight to ten weeks.

Symptoms, Diagnosis, and Treatment.—Light infections do not produce any symptoms in cattle. Severe infections may cause fever, increased pulse rate, panting, and diarrhea, usually ending in death in three weeks. No lesions are noticeable.

The diagnosis is made by finding cysticerci after death or slaughtering. Serologic diagnosis is not satisfactory. There is no known treatment for the condition in cattle.

Prevention.—Infection in cattle can best be prevented by the proper disposal of human feces and treatment of infected human beings. Thorough inspection, proper refrigeration, and cooking of beef will prevent human infection. Storage at 15F. for ten days or heating to a temperature of 140F. throughout will kill the cysticerci.

Occurrence.—The Meat Inspection Division reports that less than 0.5 per cent of all cattle slaughtered are infected. Most bovine infections have occurred where workers from Mexico have contaminated forage, such as sugarbeet tops.

TRICHINOSIS

Trichinella spiralis, the cause of this disease, is primarily a helminth of swine. Man becomes a victim only as a consumer of infected pork that has not been properly processed or cooked. The habitat of the adult worms is the small intestine of swine, man, rats, and several other animals. The same animal acts as the primary and intermediate host. The adult male is approximately 1.5 mm. long; the female, 3 to 4 mm. in length. The eggs measure from 30 to 40 microns; the larvae develop in the uterus and can only pass singly through the vagina and vulva.

Life Cycle.—Adults live only temporarily in the host and larvae for a long period. To complete the life cycle, flesh containing viable cysts must be eaten by another host. The larvae in insufficiently cooked meat are ingested and after the meat fibers and capsules are digested in the small intestine, the minute worms are liberated. After two days, the larvae reach sexual maturity in the mucosa of the small intestine. After copulation, the male dies while the gravid female develops and produces several broods of larvae. One female can produce as many as 1,500 larvae.

The larvae enter the lymph ducts and the blood stream through the lymph glands and the thoracic duct. After reaching the venous blood, they go to the heart, pass through the hepatic and pulmonary capillaries, and enter the peripheral circulation. They are thus carried to all parts of the body and penetrate the sarcolemma of the fibers of the striated muscles. The muscles most heavily infected include the diaphragmatic, masseters, laryngeal, lingual, and intercostal.

The larvae grow rapidly and assume their spiral shape and maximum length of 1 mm. in about sixteen days. This is followed by the encapsulation of the larvae which may remain viable for as long as ten years, but ultimately undergo calcification. The life cycle is completed when the infected muscle is ingested by a new host.

Symptoms, Diagnosis, and Treatment.—The usual host, swine, develop symptoms only after severe infection. Severe cases have shown digestive disturbances, fever, muscular pains, stiffness, difficult breathing, and emaciation. No signs of the disease are observed in hogs infected with less than 800 to 900 larvae per gram of diaphragmatic muscle. Hogs with even heavier infections have made uneventful recoveries.

Trichinosis in swine is usually diagnosed only after slaughter, since severe infections are tolerated with slight symptoms. Diagnosis after death can be made by the microscopic examination of muscle flattened between slides or by the digestion of muscle fibers by gastric juice.

Prevention.—The ultimate eradication of this disease in man requires the elimination of the infection in swine. In order to eradicate trichinosis from swine, and subsequently from man, the practice of feeding uncooked garbage to swine must be discontinued. Feeding only cooked garbage would practically eliminate trichinosis. Swine fed raw garbage have from three to five times as many trichina as grain-fed swine.

Human beings can completely protect themselves by cooking all pork, and foods containing pork, thoroughly. The thermal death point for trichinae is 131F. Regulations governing meat inspection conducted by the U. S. Department of Agriculture require pork products ordinarily eaten uncooked or advertised as ready to eat to be heated to 137F. Freezing also will render larva noninfective. Five degrees F. for not less than twenty days or up to thirty days, according to the thickness of meat cut, is required by official regulations of federal meat inspection. Curing methods which utilize salt and other ingredients are also effective in destroying the vitality of any trichinae that may be present in the muscle tissue.

Incidence.—The incidence of human trichina infection in the United States has been said* to be roughly 17 or 18 per cent. This *does not* mean that this percentage of the people in the United States have or have had the disease or that they manifest clinical symptoms of trichinosis. All surveys indicate that a rather large number of larvae must be ingested in improperly cooked or processed pork if noticeable adverse effects are to be exhibited by the host. The number of larvae that must be present in order to produce clinical symptoms are highly speculative. In one study in which 1,000 diaphragms were examined, 0.5 per cent had infections of more than 100 larvae per gram. In these cases the medical history of patients, so far as recorded, did not show a lifetime record of clinical trichinosis.

*Lewis, Lee W., Baller, Anna E., Hoskins, Preston, and Merillat, L. A.: Trichinosis and Nonclinical Infections with Trichinella Spiralis, J.A.V.M.A., *114*, (Jan., 1940): 35-39.

Abstracts of Papers

to be Presented at the

AVMA Eighty-Seventh Annual Meeting

Miami Beach – August 21-24, 1950

Section on General Practice

The Puerperal Cow

H. E. Kingman, D.V.M.
Cheyenne, Wyoming

The puerperal phase deals with a series of changes that take place in the genital system from the time the fetus is delivered until the genital tract has returned to normal. It is made up of a number of concomitant and integrated events that are defensive, devolutionary, reparative, and involutionary. They take place in an orderly, effective, chronological, and integrated pattern.

Some of the routine procedures and essential prerequisites to successful handling of the puerperal patient are: (1) a knowledge of the physiology of normal reproduction, including the nutritional requirements to support gestation; (2) a thorough and growing knowledge of the unphysiologic phenomena and pathologic changes seen in the genital tract; (3) careful examination to discover and correct any systemic condition predisposing to, or concomitant with, puerperal pathology; (4) knowledge and use of diagnostic aids; (5) avoid exhausting manipulation of a weakened and depressed patient; (6) consistent use of rubber gloves, rubber clothing, and rubber boots to protect clinician and patient; (7) detailed recording of results of examination and treatment for future use.

Regular use of such a routine will eliminate loss of time in a reproductive cycle in all puerperal cows, even those in which the uterus has been damaged and the fetal membranes have been retained.

Internal Parasites of Farm Animals Diagnosis and Control

R. D. Turk, D.V.M., M.S.
College Station, Texas

The control of clinical cases of parasitism is based upon a correct diagnosis, correction of errors in management, particularly those of sanitation and nutrition, and choice of the anthelmintic available for the animals affected.

Authentic information as to the efficacy of anthelmintics in large animals is limited, due to difficulties inherent in maintaining these animals under conditions necessary for critical or controlled studies. Even less information is available concerning the influence of nutrition, age, and concurrent infections on the pathogenicity of various parasites and on the response of the host to medication.

With these factors in mind, an attempt has been made to evaluate a limited number of the chemicals and formulations available as anthelmintics in farm animals. Carbon disulphide remains the drug of choice for Gasterophilus sp. larvae, the nematode stomach worms, and horse ascarids. Phenothiazine in 2-Gm. daily doses appears to be a safe and effective control of equine strongylosis. Hexachloroethane-bentonite suspension is recommended in control of fascioliasis of cattle and sheep. Sodium fluoride, given at 1 per cent concentration in dry feed, has proved a satisfactory anthelmintic for control of swine ascariasis. Suggestions as to preparation of the animals, aftercare, and possible sequelae are given.

Kodachrome prints of some of the conditions and parasites discussed are shown.

The Incidence of Anaplasmosis and Related Factors in Veterinary Practice

Paul L. Piercy, D.V.M.
Athens, Georgia

Beginning with early observations that resulted in the recognition of anaplasmosis as a distinct disease entity of cattle, this paper concerns certain aspects of the knowledge which has subsequently been obtained. Important practical problems relative to incidence, increasing distribution, and control measures are discussed in some detail.

Concentrated investigation has incriminated many arthropods (ticks, flies, mosquitoes) as capable and potential natural vectors under experimental conditions. Satisfactory and practical measures for controlling natural vector populations and activities have not been developed. Another very important, though inexcusable and controllable transmitting agent, is man himself, when he fails to practice adequate sterilization

during dehorning, vaccinating, and other animal-to-animal surgical procedures. Transmission by man may well provide initial clinical cases that prove most excellent sources for transmission by natural vector agents.

Means for accurate diagnosis of anaplasmosis have been decidedly limited, especially after recovery when Anaplasma organisms disappear from the circulating blood. In recognition of the need for a practical test of high accuracy, a complement-fixation procedure has been under study recently by the Bureau of Animal Industry, USDA. Results indicate the possession of markedly high accuracy for the test in the detection of both clinical and recovered carrier cases of the disease.

Efforts to find specific chemotherapeutic agents for destroying the causative agent in the blood of clinically-affected and/or carrier animals have been disappointing.

The possibility of establishing life-time immunity by inoculating cattle with blood harboring either *Anaplasma marginale* or *Anaplasma centrale* has long been recognized, but it does produce carriers which can be sources for new outbreaks of anaplasmosis. The application of this method as an over-all control measure has not been thoroughly studied.

An Approach to the Etiology of Ketosis in Dairy Cows

J. C. Shaw, Ph.D., B. C. Hatziolos, D.V.M., and E. C. Loffel, M.S.

College Park, Maryland

Some of the more important histopathologic findings observed in cows with ketosis have been regressive changes of the anterior lobe of the pituitary gland and degenerative areas in the adrenal cortex. Permanent lesions were observed in either or both the anterior lobe of the pituitary gland and the cortex of the adrenal of cows which had developed ketosis postpartum for from two to six years consecutively. These cases included the following: (1) polymorphonuclear infiltration and giant cells in the adrenal cortex with corresponding marked fatty changes in the anterior lobe of the pituitary; (2) a large atrophic nodule and other degenerative areas in the adrenal cortex; (3) marked fibrosis of the adrenal cortex and marked lymphocytic infiltration in the pars distalis of the pituitary gland; (4) marked cystic areas in the pars distalis resulting in the development of a very large residual lumen filled with colloidal fluid and degenerative areas of the adrenal cortex with presence of heavy pigmentation; and (5) atrophy of the anterior lobe of the pituitary gland due to a structural abnormality of the walls of the cella turcica.

Two cows with ketosis have responded to cortisone injections and 4 to adrenal cortical extracts. Numerous gross abnormalities have been observed in addition to those of the pituitary and adrenal glands. These include several cases of inflammation or congestion of the abomasum and/or small intestine, an ulcer, metritis, and lipofibroma around one kidney and adrenal. It is considered significant that in practically all of the cases the cows exhibited typical symptoms of ketosis and showed a marked improvement following the injection of glucose.

Fasting cows postpartum produced marked hypoglycemia, ketonemia, a low liver glycogen, and a fatty liver in more than 30 cases, but failed to produce the typical symptoms of spontaneous ketosis. The liver of cows in the beginning stages of ketosis is usually not fatty except where the cows have been fasted. The fatty liver of ketosis appears to be due to the effect of inanition. Three cows developed inappetence from fasting in addition to hypoglycemia and ketonemia, but no response was obtained from glucose injections.

On the basis of the above results, it is proposed that ketosis in dairy cows is basically a disease of the so-called general adaptation syndrome involving the pituitary-adrenal cortical system and is brought on by various stresses during a period when the organism is over-worked.

Radiotherapy for Large Animals

Myron Thom, D.V.M.

Pasadena, California

It is the duty of veterinarians to provide the animal-owning public with every proved means of treatment and diagnosis. Further, it is the duty of our veterinary colleges to provide students with more training in the field of radiodiagnosis and radiotherapy. Some schools have no radiotherapy equipment whatever; others have equipment ranging from inadequate to the very finest obtainable. However, no American college has a full-time radiologist, that is, a professor who devotes his entire time to x-ray diagnosis, treatment, and experimentation. Professor Alois Pommer at the Tierärtzliche Hochschule in Vienna had such a full-time professorship before the nazi occupation of Austria. Regardless of how well trained a radiologist may be, he is expected to do radiology as a sideline. It is the neglected step-child, or rather the unborn child, of veterinary medicine.

In recent years, a number of veterinarians have been doing radiodiagnosis in both large and small animal medicine, and a few have been giving x-ray and radium treatments to small animals. Outside of the colleges, little has been done in the field of radiotherapy in large animal practice. The public is demanding more and more radiotherapy in small animal practice, and with the knowledge of what x-ray and radium can do in the treatment of infections, inflammations, and tumors in valuable large animals, there will be a like demand for the services of trained veterinary radiologists in that field.

The paper will discuss the treatment with x-ray

of several types of lameness in the horse and certain tumors in breeding stock, and the treatment of cancer of the eye in Herefords by both x-ray and radium.

Pathologic Conditions Affecting the Equine Foot and Their Treatment

C. E. Dee, D.V.M.

Hollywood, Florida

The old saying, "No foot, no horse," is very true regardless of the economic value of the animal and the purpose for which the animal is used. However, more importance must be placed upon the finer bred animals, such as the show horse and the running horse.

Pathologic conditions may be classified and grouped into the following classes:

1) conditions arising due to faulty conformation in the animal
   a) weak heels
   b) contracted foot
   c) dropped sole
   d) brittle hoof
   e) crooked foot
   f) club foot
   g) curved foot
2) diseases arising from faulty conformation in the animal
   a) sand crack
   b) corns
   c) bruised sole
3) wounds of the foot
   a) nail bound
   b) nail pricks
   c) acute and chronic coronitis
4) acute inflammatory conditions of the foot
   a) laminitis—acute and chronic
   b) seedy toe
   c) thrush
   d) quittor
   e) side bone
   f) ring bone
   g) navicular disease
5) fractures

This outline classifies most of the pathologic conditions affecting the equine foot; special emphasis will be placed upon laminitis (acute and chronic) and thrush. Treatments for all such conditions will be discussed.

Practical Insecticide Toxicology for Veterinarians

R. D. Radeleff, D.V.M.

Washington, D.C.

Since 1940, DDT, TDE, methoxychlor, chlordan, lindane, toxaphene, and parathion have been developed and made available for use on various plants and animals. Many more insecticides are being tested and some of them may prove to be superior to those already in use.

Some of the available insecticides are useful against a wide range of parasites, while others are quite limited. This variation of toxicity to insects carries over to our domestic animals and to plants. Certain species are highly susceptible to insecticides, such as the dog to toxaphene and the cat to lindane. Among farm animals, the young dairy calf is usually the most susceptible, the hog the most resistant. Susceptibility also varies with the breed within a species, illustrated by Herefords usually being more resistant than Jerseys.

Resistance of a given breed usually increases with approaching maturity. Certain insecticides, notably DDT and TDE, require large dosage to produce acute toxic effects but very minute amounts of them often repeated will produce considerable damage.

All the available new insecticides, except parathion, can be stored in animal tissues, notably the fats. Storage results after dipping, spraying, dusting, or the consumption of insecticide-treated feed. The extent of storage depends upon the dosage, frequency, formulation, and method of exposure. There may be additional factors.

Such stored insecticides are depleted at varying rates, some very slowly, some quite rapidly. Most of the insecticides appear in the milk of lactating animals following treatment or exposure.

The use of these modern insecticides is of toxicologic interest not only in animals but also because of the human hazard that may be created, it being obvious that persons consuming meat and milk containing insecticides will in turn store them and, possibly, be affected by them.

Veterinarians, whether they be practitioners, food inspectors, or quarantine and eradication officials, must consider three points in recommending or using these new insecticides: (1) acute effects upon the animal; (2) chronic effects upon the animal; (3) public health hazard that may be created by such usage.

The Influence of High Salt Intake on the Physiology of Ruminants

W. J. Pistor, B. S., D.V.M., J. C. Nesbitt, and B. P. Cardon, Ph.D.

Tucson, Arizona

Five pregnant Hereford cows were fed for seven months on a maintenance ration supplemented with 1 lb. of salt per animal per day. The feeding was started three months before calving. At periodic intervals the sodium chloride content of the blood, urine, and feces of the cows and calves was determined. Results showed that, throughout the experiment, there was no indication of any detrimental effect caused by the high salt intake.

In another series of experiments, the site and

rate of absorption of salt from the intestinal tract was determined. Changes in NaCl content of the intestinal contents, blood, urine, and feces were determined hourly over a twelve-hour period after the administration as a drench of 1 Gm. of salt per pound of body weight.

The physiologic relationship between salt and water was also studied. It was found that the sodium chloride content of the urine rarely increased beyond 2.3 per cent. Death caused by the intake of an excessive amount of salt is a result of dehydration of the body tissues. Consequently, if a large amount of salt is consumed, sufficient water must be given so that the salt can be eliminated in the urine.

Latest Developments on Vitamin B_{12}, APF, and Related Factors

T. J. Cunha, Ph.D.

Gainesville, Florida

APF contains vitamin B_{12}, aureomycin, and possibly other factor(s). With a corn, peanut meal, mineral (including trace minerals), and vitamin (all known vitamins which the pig has been shown to need) basal ration, the addition of APF has had the following effects: (a) increased the rate of gain 33 to 125 per cent; (b) decreased the amount of feed required per 100 lb. of gain; (c) decreased the need for methionine and the amount of protein needed in the ration; (d) increased appetite, bloom, and caused the pigs to have a smoother coat; (e) prevented occasional scours; and (f) resulted in pigs on the corn-peanut meal ration gaining as rapidly as the pigs fed a corn-fish meal ration. B_{12} and APF supplementation increased the rate of gain of pigs fed corn-soybean oil meal rations. Aureomycin supplementation of corn-peanut meal rations considerably increased the rate of gain of pigs. Aureomycin also prevented scours. The practical application of recent developments in APF, B_{12}, and aureomycin to swine production and veterinary medicine will be discussed.

Mineral Supplements and Their Use

R. B. Becker, M.S., Ph.D.

Gainesville, Florida

Early knowledge of need of minerals for nutrition dates back to natural salt licks, "changing the range" seasonally, and use of salt in barter by uncivilized tribes. Recently, additions to knowledge include such things as cobalt, vitamin B_{12}, and study of radioisotopes.

Separate mineral elements are minor in amounts required but are essential for structural and functional uses in the body. Their importance, even in quantities as small as one part in ten million of feed, is emphasized by submarginal intake over an extended time. When mineral shortage is suspected, one scrutinizes character of the soil, water supply, kinds and amounts of feeds offered, and the specific indications of deficiency exhibited by typical animals. Animal requirements vary with relation to initial storage of nutrients, growth, fattening, reproduction, and lactation (as illustrated with slides).

Elements lacking naturally in different regions include common salt (chlorine), iodine, calcium, phosphorus, iron, copper, cobalt, sometimes manganese with confined poultry and winter litters of pigs. Magnesium is short temporarily in grass tetany. When supplemental phosphorus is used, its fluorine content should not exceed one part in 40, as the latter is an accumulative toxic substance causing economic loss before the toxic effect becomes evident.

It is economically desirable to use specific mineral supplements locally or regionally, rather than to prescribe one standard supplement for universal use.

Antihistamine Therapy in General Veterinary Practice

A. H. Quin, D.V.M.

Kansas City, Missouri

This paper outlines briefly the role of histamine in normal metabolism, together with the known pathologic manifestations associated with histamine imbalance in domestic animals.

The various conditions in which antihistamine therapy is indicated are cited. These include photosensitization, anaphylactic and anaphylactoid reactions, bovine and equine laminitis, urticaria, bovine mycotic stomatitis, allergic rhinitis, ophthalmia, dermatites, toxemias of digestive origin, so-called protein poisoning, the toxemia of placental retention, tympanites and chronic bloating of cattle, and as an adjunct in the therapy of bovine respiratory diseases.

The clinician should keep in mind that available antihistamine products are not pharmacologically or chemically identical; that they are powerful drugs, especially when used intravenously; that systemic side reactions are variable; that such products are not curative *per se*; and that medication must be maintained so long as the histamine sensitization factors are present.

Contraindications for antihistamine therapy, suggested dosage scales, and other pertinent clinical data are cited.

(*Continued on next page*)

Section on Research

Brucella Infection in Bulls and the Spread of Brucellosis in Cattle by Artificial Insemination. I. Intrauterine Injection

C. A. Manthei, D.V.M., D. E. DeTray, D.V.M.
E. R. Goode, Jr., D.V.M.
Beltsville, Maryland

Brucellosis has been transmitted through the semen of a naturally infected bull to susceptible heifers and cows by artificial insemination.

Brucella abortus has been isolated from 80 successive ejaculations of semen obtained from the bull used in this experiment. These semen collections were made for eighteen months. Immediately before the exposure of cattle by artificial insemination, the potency of the bull was determined by natural mating with 3 cows, all of which conceived on the first service.

Twelve susceptible cattle were artificially inseminated by intrauterine injection of semen from the infected bull. Six of the females were virgin heifers approximately 20 months of age and the other 6 cows had completed one normal gestation and were approximately 32 months of age. Of the 12 cattle artificially inseminated with semen containing virulent *Br. abortus*, 6 virgin heifers and 2 cows developed active brucellosis. Only 2 of the 8 infected animals were diagnosed as having conceived; one heifer aborted at 104 days of gestation and the other had a full-term calf. Two of the 4 cows in which no evidence of infection has been demonstrated have conceived; 1 has delivered a full-term calf and the other aborted at 219 days of gestation. *Brucella abortus* was not isolated from these 2 animals at the time of parturition. The remaining 2 cows have not conceived after three inseminations.

Experiment on Vaccination Against Johne's Disease

Aubrey B. Larsen, D.V.M.
Auburn, Alabama

An experiment was initiated in 1946 to study vaccination against Johne's disease when challenged with known amounts of infective material. Ten heifer calves were used. They were purchased at 1 day of age from herds free from tuberculosis and Johne's disease. Seven of the calves were vaccinated subcutaneously at 2 weeks of age with an oil suspension of living *Mycobacterium paratuberculosis*. The remaining 3 were kept as controls. At 2 months of age, each of the 10 calves was challenged with 40 Gm. of infective intestinal scrapings, divided in two doses and administered orally on two successive days. The 10 animals were raised under average farm conditions and were closely observed. Vaccination apparently had no ill effect on their health. The 3 nonvaccinated animals died from clinical Johne's disease at 15, 24, and 26 months of age. Three vaccinated animals died from clinical Johne's disease at 18, 34, and 38 months of age. Two vaccinated animals died from causes other than Johne's disease at 12 and 32 months of age. Two of the vaccinated animals are still living (1950) and appear normal in every respect.

All the animals gave either positive or suspicious reactions to the intradermal johnin test one or more times during their lives. Of the 7 vaccinated animals, 5 gave either positive or suspicious reactions to the intradermal tuberculin test one or more times during their lives.

Histologic Changes in Skin of Cattle Due to Intradermic Johnin Reaction

E. P. Johnson, D.V.M., M.S., Ph.D.
Blacksburg, Virginia

This study was made on both artificially and naturally sensitized cattle for the purpose of obtaining additional information on the following: (1) if the histologic structure of the local response to intradermic johnin of animals with Johne's disease differs from that of the local response to intradermic tuberculin of cattle affected with tuberculosis; (2) if the histologic pattern of the reaction in naturally infected animals with clinical evidence of the disease differs from that of such animals with no clinical evidence of the disease; (3) if the reaction areas in artificially sensitized cattle with no evidence of disease differ in histologic features from those in naturally sensitized animals giving clinical evidence of the disease; (4) if the degree or size of reaction can be correlated with the extent of the lesions present or with the degree of symptoms manifested by the infected animals.

Briefly, it was found that the essential histologic features in the reactions of the three groups of cattle studied were strikingly similar. There was marked variation in degree, but the pattern of cellular reaction was quite uniform. No correlation was found to exist between the degree or size of reaction and the degree of symptoms manifested by the animals. The most constant feature in the histologic picture was a cellular infiltration which was predominantly around the blood vessels and tissues of the epineurium. The predominating cells were histiocytic, but a moderate number of lymphocytes occurred. Occasionally, mononuclear, acidophilic granulocytes were present. On the whole, the histologic picture was similar to what occurs in tuberculin reactions except that the extent and degree of reaction was usually less pronounced.

Impaired Breeding Performance in Cattle as Observed Under Field Conditions and Results of Common Treatments Applied

A. H. Frank, B.S., M.S., D.V.M.

Beltsville, Maryland

Records of all heat periods, breedings, and calving were kept on more than 2,000 cattle in commercial dairy and beef herds in the vicinity of Beltsville, Md. Impaired breeding performance was observed in more than half of the females. This was found to be true in herds free from brucellosis and trichomoniasis. About 25 per cent of females free of these infections failed to come in heat after calving. Another 25 per cent failed to conceive when bred. These cows were divided into groups of equal numbers for comparison of different treatments. One group of each classification received mechanical treatment (removal of corpora lutea, rupture of cysts, and massage of ovaries); a second group received mechanical treatment simultaneously with pregnant mares' serum (PMS); a third group received PMS alone; and a fourth group was kept as untreated controls. As a whole, the treatments were not effective. The history of trouble in some herds indicated the presence of an unrecognized infectious agent of venereal nature, the affected cows repeatedly returning to service.

Repeated Vaccination of Cattle with Brucella Abortus Strain 19. II. Results in a Large "Problem" Herd

D. T. Berman, D.V.M., Ph.D., Lois M. Jones, B.A., M.S., and B. A. Beach, D.V.M.

Madison, Wisconsin

Programs of test and slaughter, and test and slaughter with calf vaccination, in force for many years, failed to eradicate brucellosis from a large dairy herd. A scheme based on revaccination with strain 19, together with raising all replacements, was initiated. Cows negative to serologic and bacteriologic tests for Brucella at parturition were revaccinated within sixty days. From none of 473 animals so vaccinated was strain 19 isolated from the milk one week after vaccination, or at subsequent parturitions. Revaccination at the peak of lactation apparently does not result in the establishment of strain 19 in the uterus or udder.

A second vaccination resulted in a rapid rise of agglutinin titer, followed by a rapid decline. Six months after revaccination, fewer than 20 per cent were reactors, and a year after revaccination, fewer than 10 per cent were persistent reactors. The abortion rate fell from 14 per cent to 3 per cent, and production increased by 20 per cent. The clinical results and bacteriologic findings indicate that brucellosis has been eradicated. The relative importance of revaccination and improved sanitation in accomplishing these results is difficult to evaluate.

Free Fatty Acids in the Blood of the Normal Parturient Cow, in Milk Fever, and in Ketosis

A. H. Craige, Jr., V.M.D.

College Park, Maryland

Free fatty acids were determined by a modified Saarinen method consisting in extraction of the acidified serum by ether and petroleum ether and subsequent titration with KOH to pH 9.5 determined electrometrically. Serum-free fatty acids (FFA), thus determined, rose from less than 0.2 milliequivalents (mEq.) per liter in midlactation to a maximum ranging from 0.3 to 1.0 mEq. per liter at parturition in cows manifesting no clinical symptoms. Assuming a mean molecular weight equals 27.7 mg. per 100 ml. Serum FFA began to rise several days prior to parturition, and reached a maximum within three days after parturition, after which FFA fell rapidly in normal cows. In cows that later developed ketosis, serum FFA remained high and did not fall significantly until the symptoms abated. Milk fever was accompanied by FFA levels comparable to those in uncomplicated parturition, but serial examinations of serum FFA and Ca, before and after parturition, suggest the possibility that an interaction between FFA and Ca may be instrumental in causing the acute hypocalcemia of milk fever.

A Complement-Fixation Technique as Applied to the Study of Foot-and-Mouth Disease and Vesicular Stomatitis

Fernando Camargo N., D.V.M., Ervin A. Eichhorn, V.M.D., Jacob M. Levine, B.S., M.Sc., M.D., and Alfredo Téllez Girón, D.V.M.

Mexico City, D. F., Mexico

As a result of an extreme need for a rapid and accurate *in vitro* test for the presence of foot-and-mouth disease virus in specimens received from the field, a complement-fixation technique was developed for the study of field specimens and also virus suspensions prior to their incorporation into vaccine. This technique was shown to have an error of less than 1 per cent in over 250 specimens tested. It lends itself to ease of manipulation and to the analysis of a relatively large daily number of specimens by few personnel.

Error is minimized through the use of a spectrophotometer in all readings and permits a closer interpretation of results. With the "rapid ether" method of antigen preparation described, the reporting of results has reduced the necessary time

from the receipt of the specimen to approximately four hours. This technique permits of a rapid, economic, and accurate serologic differential diagnosis between foot-and-mouth disease and vesicular stomatitis viruses, and between types and strains of these diseases.

The Viability of Brucella Suis in Swine Carcasses

L. M. Hutchings, B.S., D.V.M., M.S., Ph.D., Doris E. Bunnell, B.S., M.S., C. R. Donham, B.S., D.V.M., M.S., and W. W. Bay, B.S., D.V.M.

Lafayette, Indiana

Since brucellosis of swine is considered an important reservoir of disease transmissible to man, a study was initiated to determine the livability of *Brucella suis* in the tissues of swine which had been either naturally or experimentally exposed to brucellosis.

A total of 61 Brucella-exposed swine, 15 males, 40 females, and 6 barrows (51 naturally exposed and 10 experimentally exposed) of various sizes and ages were slaughtered and immediately examined bacteriologically for *Br. suis*. The carcasses, vital organs, some regional lymph nodes, and sexual organs of 45 of these swine were held at 40 F. or slightly below and reëxamined periodically for *Br. suis*.

Of the 61 swine, 45 yielded *Br. suis* from one or more areas of the body on initial examination; a total of 46 swine yielded *Br. suis* from the tissues at some time during the study.

Brucella suis was isolated at some time during the study from each of the 35 areas examined in female swine and from each of the 39 areas examined in male swine. The organism was found to predominate in lymphatic tissue, sexual organs, and liver. Of 5,056 cultural examinations made, 338 were positive for Brucella.

Recoveries of *Br. suis* were made from some of the swine carcasses on initial examination only; while recoveries were made from other carcasses at variable intervals up to twenty days after slaughter (the maximum time any swine were held under refrigeration).

BAL, Antidote for Arsenic and Other Metals

George T. Edds, B.S., D.V.M., M.S.

College Station, Texas

Administration of the arsenicals and mercurials with an occasional overdosage, added to frequent examples of careless usage on the farm or ranch, improper storage and disposal of incompletely emptied containers with severe toxicity to animals and poultry, poses one of the current antidotal problems. Until the introduction of the dithials, with BAL or 2,3-dimercaptopropanol as representative of the group, no satisfactory agent was available to counteract the harmful action of arsenic and other metals to the tissues.

Proper evaluation of this agent experimentally should include several important principles. First, a uniformly fatal dosage of arsenic or other metal must be determined. The m.l.d_{100} as determined on sheep, goats, and poultry varied in some instances from that reported in the literature. Second, symptomatology of assumed therapeutic and established toxic doses were recorded so that these would not be confusing when treating clinical cases. Third, the effectiveness of BAL as an antidote against arsenic is herein reported.

An important phase of this study is the rate of absorption, storage, and elimination of arsenic without, and with, the administration of BAL. Too, work in this field has expanded our knowledge of the intracellular enzyme systems, their dependence on certain -SH or sulfhydril groups attached to protein molecules, and the disturbance in normal cellular metabolism by arsenicals.

BAL has been proved effective against arsenic, mercury, bismuth, antimony, and chromium intoxication but ineffective for lead, thallium, and selenium. A review of certain clinical cases will demonstrate its effectiveness against arsenic.

The Application of the Complement-Fixation Test to Fox Distemper

M. Savan, B.S., D.V.M., M.S., and C. A. Brandly, M.S., D.V.M.

Madison, Wisconsin

The possibility of using the complement-fixation test as an aid in the diagnosis of distemper among Canidae was reinvestigated. Tissues collected from foxes experimentally infected with distemper were prepared as antigens by lyophilization and benzene extraction, and were subsequently employed in a complement-fixation test with serums obtained from normal and infected foxes. It was possible to define a specific test for distemper by means of which the fixation of complement was demonstrable with antigens prepared from distemper-infected tissues such as lung, kidney, and liver; however, antigens prepared from spleens proved to be the most potent. The spleens collected from experimentally infected foxes on the sixth and eighth days after exposure to distemper virus had a high virus content as demonstrated by animal inoculation; and, in addition, this same splenic material yielded the best antigen for the complement-fixation test. Complement-fixing antibodies were first demonstrable in the serum of infected foxes on the twelfth day after exposure and with increasing and maximum titers on the fourteenth and sixteenth days. Commercial distemper antiserum of canine origin proved to be anticomplementary, such activity being reducible by heating at 56 C. for twenty minutes or at 60 C. for five minutes.

Mammalian Adaptations of Newcastle Disease Virus

A. L. Brueckner, V.M.D., R. L. Reagan, D. M. Schenck, B.S., H. O. Werner, B.S., and J. W. Hickman, B.S.

College Park, Maryland

Adaptations of Newcastle disease virus (California strain 11914), effected at College Park, are presented. The information is in the nature of a summary of studies already published, studies in process of publication, and studies not publicly referred to.

The virus was first established in the Syrian hamster by intracerebral injection. After the eighth subinoculation, the mortality has been consistently 100 per cent. The incubation period has been decreased through 325 subinoculations. Symptoms have varied only slightly from the primary inoculation. The one important difference noted has been evidence of paralysis of the pharynx as shown by excessive salivation. Attempts to establish the hamster-modified virus in the same species by intradermal and intratesticular injections and intranasal instillations were not successful until well-advanced numerical intracerebral passages had been reached.

A disease in a sheep and a calf, manifested by symptoms of central nervous system involvement, was produced by intracerebral injection of the hamster-adapted virus of an early hamster passage. No attempt has been made to carry the virus in sheep and cattle. Subinoculations in ferrets and rabbits were possible only through a small numerical series. White Swiss mice proved irregularly susceptible to intracerebral injection to the hamster-modified virus through an extended series of subinoculations. A Rhesus monkey, injected intracerebrally by hamster-modified virus of an early passage, showed nervous symptoms followed by paralysis and death. An attempt made to establish the virus in one other monkey was unsuccessful. Later hamster passages readily established disease in Rhesus monkeys by intracerebral injection, and this virus has now been carried through more than 13 subinoculations in the same monkey species.

Aureomycin in the Treatment of Experimental Infections of Poultry

J. E. Prier, D.V.M., M.S.

Urbana, Illinois

Aureomycin is effective against both gram-negative and gram-positive bacteria and against certain rickettsiae. It has a relatively low toxicity and is active following oral administration. There are few reports in the literature concerning its use in animal and poultry diseases. It has been reported to have therapeutic value in staphylococcic mastitis and experimental pasteurellosis of chicks.

Studies have been conducted to determine the therapeutic value of aureomycin in the following experimental infections of poultry—fowl cholera, turkey erysipelas, infectious sinusitis of turkeys, and fowl typhoid. Both *in vitro* and *in vivo* tests have been made on the infectious agents involved. Therapy was administered both orally and parenterally.

Experimental infections with the agent of infectious sinusitis of turkeys and *Erysipelothrix rhusiopathiae* in turkeys did not respond favorably to aureomycin therapy. Intramuscular inoculations of aureomycin in chicks infected with *Pasteurella multocida* were effective in reducing mortality as compared with untreated controls. Parenteral aureomycin therapy did not decrease the mortality from *Salmonella gallinarum* infection in chicks, but drugged feed showed an apparent prophylactic action.

(Continued on next page)

Former ASTP Students Should Volunteer for Active Service

The following information was received from Brig. General J. A. McCallam, V. C., subsequent to the information concerning the military status of veterinarians, appearing on page 157.

The Army Veterinary Corps urgently needs veterinary reserve officers for active duty in the grades of captain and lieutenant. The periods of active duty are for one, two or three years. Officers with previous service in the Veterinary Corps Reserve or AUS will be accepted for one year; those without prior service must agree to serve for a minimum of two years.

General McCallam, Chief, Army Veterinary Service, calls on those veterinarians who were in the ASTP during World War II and were thereby deferred from active military service, in order to complete their education, and have not served in the Armed Forces since graduation to volunteer immediately for active duty in the Veterinary Corps Reserve. He feels such individuals have a moral obligation to serve their country. They are needed now.

For application blank and other particulars telephone Republic 7400, extension 4197; or telegraph or write to the Veterinary Division, Office of The Surgeon General, Department of the Army, Room 2055, Main Navy Bldg., Washington 25, D. C.

Section on Surgery and Obstetrics

Rumenotomy in Cattle

Arthur B. Christian, D.V.M.

Biltmore, North Carolina

The film and commentary is mainly concerned with the use of this operation in relation to traumatic gastritis. It covers etiology, symptoms, diagnosis, and the technique of the operation.

The symptoms are mainly those of peritonitis; the animal assumes an attitude of pain, temperature is elevated, the onset is sudden with loss of appetite and diminished milk flow.

An early diagnosis is essential to a successful recovery. A careful and complete physical examination is very important to eliminate other diseases which present similiar symptoms. The use of the stethoscope and percussion in the region of the reticulum is a definite aid in the diagnosis.

The film itself shows the technique of the operation, including such details as anesthesia, method of entering rumen, and suturing.

More than 100 rumenotomies have been performed with a mortality of less than 10 per cent, and a return of the animal to normal in a week to ten days in over 75 per cent of the cases.

The Nerves and Arteries of the Bovine Foot

Robert E. Habel, D.V.M., M.Sc.

Ithaca, New York

The nerves and arteries of clinical importance distal to the carpus and hock are described and illustrated. The following points of injection are recommended for anesthesia of the digits of the forefoot: (1) middle of the dorsal surface of the metacarpus, medial to the tendon of the medial digital extensor; (2) lateral groove between the interosseus tendon and the metacarpal bone, 5 cm. proximal to fetlock; (3) lateral groove between the interosseus tendon and the flexor tendons, 5 cm. proximal to the fetlock (points 2 and 3 are reached with one insertion of the needle); (4) the volar groove at the bifurcation of the flexor tendons; (5) medial groove between the interosseus tendon and the flexor tendons.

For anesthesia of the digits of the hind foot, the following points of injection are recommended: (1) proximal to the middle of the dorsal surface of the metatarsus, medial and lateral to the dorsal metatarsal vein, and deep between the tendons to the dorsal groove of the bone; (2) lateral to the flexor tendons in the middle of the metatarsus; (3) medial to the flexor tendons at the same level.

In the fore and hind feet, the common digital artery bifurcates at a variable distance proximal to the pastern joint. In an amputation through the first phalanx, three arteries will be encountered on each digit: (1) the main artery, the proper digital, on the axial surface; (2) the artery to the bulb; (3) the abaxial artery, medial or lateral, depending on the digit involved.

In an amputation through the coffin joint, only one large artery is cut—the proper digital near the extensor process of the third phalanx.

Pregnancy Diagnosis in Cows

G. R. Moore, A.B., D.V.M., M.S.

East Lansing, Michigan

In this presentation, the various changes in the anatomy and physiology of the genital organs associated with pregnancy in the cow and detectable by rectal examination are briefly reviewed. Material is illustrated with kodachrome projection slides. Throughout the presentation, emphasis is placed on means of determining the stage of pregnancy by clinical examination.

Spaying Heifers and Cows

C. C. Carlton, D.V.M.

Arcadia, Florida

The advantages of spaying heifers and cows are: (1) They can be ranged with steers and bulls; (2) they fatten more easily and quickly; (3) they bring more when marketed, as they grade better and dress out higher.

These advantages apply equally well to over-age dairy cows, in which case it is advisable to milk them a year or more before marketing.

The advisable time to perform the operation is about five weeks after parturition in older cows, and always before the cow or heifer has been pregnant thirty days.

Details regarding the restraint, the surgical procedure, and the after-care are discussed fully.

Impaired Fertility in the Beef Cow

G. T. Easley, B.S., A.M., D.V.M.

Sulphur, Oklahoma

Selection of beef cattle that lay on flesh easily has essentially been selection toward a hypothyroid condition. The possible influence of this on fertility is mentioned. Excessive fat impairs blood circulation, reduces resistance to infection, suppresses the endocrine system, and obstructs and limits the normal movements of the reproductive system. The influence of season on the estrous cycle of the beef cow is very distinct. Cycles are

much more regular in winter and the response to treatment is much more predictable.

The value of history and physical, serologic, and bacteriologic examinations in making a proper diagnosis is emphasized. Impaired fertility and the recommended treatments are discussed under six headings: (1) vaginitis; (2) mummified fetus; (3) failure to show signs of estrus due to silent heat, a retained corpus luteum, or nonfunctional ovaries; (4) abnormally short estrous cycles resulting from a cystic ovary, improper development of the corpus luteum, or absence of corpus luteum; (5) abnormally long estrous cycles brought on by senility, excessive fat, small multiple cysts on one or both ovaries, or fibrotic ovaries; (6) cows that are apparently normal in every respect yet fail to conceive after repeated services.

Anatomic, histologic and bacteriologic studies were made after slaughter on a number of cows in this last group. The findings are discussed briefly.

Sulfonamide and Antibiotic Therapy in Veterinary Medicine

E. F. Thomas, D.V.M.

Athens, Georgia

The recent advances in the treatment of infectious diseases of animals made possible by the discoveries of bacteriostatic and bactericidal agents have inspired medical investigators to study the ever-increasing number of chemotherapeutic and antibiotic substances. Such of these agents that have been used in treatment of diseases of animals are discussed. Their numerous uses and methods of administrations are emphasized.

Sulfanilamide.—Mode of action, clinical use, and toxic manifestations. Its use is practically restricted to the treatment of streptococcic infections.

Sulfathiazole.—Mode of action, clinical use, and toxic manifestations. Its rapid excretion through the kidney makes it necessary to dose often.

Sulfapyridine.—Mode of action, clinical use, and toxic manifestations. Its use today is limited mainly, in veterinary medicine, to cattle.

Sulfamerazine.—Mode of action, clinical use, and toxic manifestations.

Sulfamethazine.—Mode of action, clinical use, and toxic manifestations. This sulfonamide has the advantage of high levels in the blood stream for longer periods, and only requires dosing at 24-hour intervals.

Sulfaguanidine, Sulfathalidine, Sulfasuxidine, and Sulfaquinoxaline.—Mode of action, clinical uses, and toxic manifestations. These are indicated in intestinal infections because of slow absorption.

Penicillin G (Sodium Salt).—Crystalline and sodium may be used interchangeably. Mode of action, blood and tissue levels, and clinical uses.

Procaine Penicillin G in Oil, and in Oil with Aluminum Stearate.—Mode of action, blood and tissue levels, and clinical uses.

Streptomycin.—Mode of action and clinical uses in comparison with penicillin, and when combined with penicillin.

Aureomycin.—Mode of action and clinical uses.

Chloromycetin.—Clinical uses.

Polymyxin.—Clinical uses.

Bacitracin.—Mode of action and clinical uses.

Anesthesia of the Bovine Animal

Geo. R. Fowler, D.V.M.

Ames, Iowa

The theory of general anesthesia is discussed and the principal drugs used and the methods of using them are considered. Indications for the use of general anesthesia are given, as well as conditions under which it should not be used. Special hazards and ways of avoiding them are next taken up, together with the use and value of antidotes for overdosage with general anesthetics.

The theories of local anesthesia are discussed. Attention is given to the various drugs and agents used in local anesthesia, and their advantages and disadvantages. The proper kind and type of instruments used in local anesthesia are given due consideration, and also the sensitive and insensitive tissues of the body. Various parts of the animal where local anesthesia is of particular importance are discussed in detail from the view point both of anatomy and physiology. The technique of infiltration anesthesia and its particular place in bovine surgery is given extended consideration. Special places where nerve blocking can be successfully used are discussed. Epidural anesthesia is described with an evaluation of its good points and its drawbacks in special conditions. Special procedures for particular purposes, such as paravertebral nerve block, is considered in detail. A final discussion is given of the use of preanesthetic sedation and its effect upon bovine anesthesia.

Some Practical Techniques of Horse-Breeding, Illustrated

F. G. Scholl, D.V.M.

Franklin, Tennessee

The film, including stills, illustrates how a general practitioner can serve the small horse-breeding establishment.

The conditions, equipment, personnel, and technique used in the large establishment are diagrammed and explained.

Teasing technique is discussed briefly. Motion pictures give many details which enable the small breeder, with the aid of his veterinarian, to over-

come the handicap of lack of personnel, equipment, and facilities. Illustrated is actual breeding under these conditions with particular reference to teasing, preparation of mare and stallion, actual cover, collection of semen both by artificial vagina and following natural cover, and the impregnation of mares.

Common sterility procedures shown include, (1) examination for pregnancy, (2) vaginal examinations, (3) taking a culture, (4) suturing the vulva.

Clinical Cases

W. J. Gibbons, D.V.M.

Auburn, Alabama

This motion picture will show, in color, cases of contracted tendons in the horse and mule. These will demonstrate the typical diagnostic symptoms used by the clinician and also the surgical correction of the contraction by resection of the deep flexor tendon.

One interesting case is that of stringhalt affecting both rear limbs in a walking horse. The operation for relief of this condition is shown and consists of removal of the tendon of the lateral digital extensor muscle.

Umbilical Hernias in Horses

D. L. Proctor, Jr., D.V.M.

Lexington, Kentucky

This paper covers a survey of approximately 3,000 foaling mares over a period of four years. Predominately, the mares were Thoroughbred; however about 15 per cent were Standardbred and 5 per cent American Saddlebred mares. It was determined between 1.5 to 2.25 per cent of the foals of these mares had umbilical hernias. Of these foals, 60 to 70 per cent were subjected to the operation for removal of the hernial sac by use of the navel clamp. One death occurred in a series of 57 operations over a six-year period. A close study of mares and stallions producing foals with umbilical hernias show no reason to believe heredity plays a part in the incidence of this condition. Incidence on certain farms would suggest: (1) technique at parturitions may be a contributing factor; (2) infection in some cases is an etiologic factor. Following the above paper, a silent, 16-mm. film will be shown featuring "The Reduction of an Umbilical Hernia" on a standing animal and discussion of operative technique and necessary instruments.

Pregnancy Disease of Ewes

J. W. Cuntelman, D.V.M.

Chicago, Illinois

This disease occurs in all parts of the country where ewes are held for lambing, and is generally believed to cause greater loss to the industry than any other disease. Synonyms for pregnancy disease include such terms as staggers in pregnant ewes, lambing paralysis, pregnant ewe paralysis, and preparturient paresis of ewes. Recently, the terms ketosis, or acetonemia of ewes, have been used when referring to the disease.

Clinical manifestations of the disease include anorexia and sleepiness, followed by such nervous manifestations as grinding of the teeth, muscle twitching, and prostration. If therapeutic efforts are to be of any value, early recognition of the disease is essential.

It is believed to be due to a lack of glycogen in sufficient quantity to support the needs of advanced pregnancy. When body fat is utilized to support the energy requirements in lieu of sufficient carbohydrate being available, partial oxidation of fatty acids results in so-called ketone body formation. Ketone bodies are ordinarily utilized for energy purposes outside the liver. When carbohydrate insufficiency is pronounced, ketone body formation in excess of the ability to utilize them results in the symptoms of pregnancy disease. Ketonuria occurs when the blood level of ketones exceeds the renal threshold for them.

The disease may be prevented in ewes by providing an adequate ration.

(Continued on next page)

Section on Small Animals

Physiological Basis for the Transfusion of Blood

James J. Griffitts, M.D.

Miami, Florida

A brief discussion of the fluid, crystalloid, and colloid balance between the vascular tree and the other tissues of the body will be presented. The role of colloids present in whole blood and their effect on the animal will be stressed. In addition, the role of transfused red cells in restoring normal physiology of the body will be discussed, based on the experience derived from transfusions in man. Methods will be presented for the calculation of dose of blood and blood components required to restore animals to normal level and the rate of transfusion will be commented upon.

Infectious Diseases of Dogs

James A. Baker, M.S., Ph. D., D.V.M.

Ithaca, New York

Comparisons have been made of the signs of illness and pathology shown by infectious hepatitis, virus of Carré distemper, and other diseases in dogs as they occur naturally and were experimentally produced. Some properties of the various etiologic agents have been described, and on these findings mention will be made of possible methods of spread. In so far as this knowledge permits, there will be a discussion of the means by which the transmission of these agents among dogs may be interrupted. Also, reference will be made to treatment mainly with the hope of stimulating further discussion and an exchange of ideas among those attending.

Dog Psychology

Clarence E. Harbison

New York, New York

Psychology is the science of the mind and its activities as evidenced by the behavior pattern. A human psychologist is one who, by education, training, and experience, can determine the extent and kind of bad behavior patterns (the juvenile delinquent), and can recommend a course of training and/or treatment that will correct or change the bad behavior pattern.

The dog psychologist, to qualify as such, must have the benefit of years of observation and experience devoted exclusively to training and handling dogs, and must constantly observe puppies, youngsters, and grown dogs. The demand for the services of the dog psychologist comes mostly from the novice dog owner, the person or family who has one dog.

The causes of the bad behavior patterns in dogs seems to develop from:

1) lack of knowledge of how to feed, care for, and train a dog;

2) failure to appreciate that it is as important to acquire the proper information for dog ownership from puppyhood to maturity, as it is for the expectant mother to prepare herself for the care, feeding, and training of a child from infancy to maturity;

3) failure to appreciate that when a puppy of 4 months to 10 months of age is acquired, it presents the same problem and requires, for all practical purposes, the same knowledge and care as a child, the ratio in age being that a 4-month-old dog approximates a 2-year-old child, a 1-year-old dog approximates a 5-year-old child, and ready for first year in school. Ninety per cent of all novice dog owners are guilty of a lack of understanding.

A few more than 600 letters received from January 15 to date reveal, that only about 20 per cent have an authoritative book on care, feeding, and training. About 10 per cent have a book devoted exclusively to training. A majority of all pet dog owners try to care, feed, and train their dogs on the unreliable information offered by every Tom, Dick, or Harry, who has but one dog.

Bad behavior patterns that develop from mismanagement of dogs include the following: viciousness toward servicemen, visitors, and members of the family; chasing cars, excessive barking, jumping on people, roaming, bad house manners, especially when left for short periods, destructive in the house, resentment at being groomed, bathed, uncontrollable indoors and out, fighting with or exhibiting fighting tendencies toward other dogs.

The chances of success for correcting bad behavior pattern in dogs from 1 to 8 or 9 years are very great; regardless of sex, in crossbred as well as purebred.

The exceptions are castrated dogs and spayed bitches. Castrating and spaying do irreparable injury to a dog's balance.

The methods the dog psychologist uses in correcting bad behavior patterns does not presuppose whipping or harsh methods. Any dog with a bad behavior pattern can easily be changed into a well-behaved dog through patience, day-to-day kindness, and firmness, and a simple system of obedience training. In treating a bad behavior case, the dog remains with the owner, who is instructed as to the plan or method recommended

Mr. Harbison is manager, the Dog Show Division, The Quaker Oats Co., New York, N. Y.

in the particular case. Thus, the owner comes to realize where he erred in his handling of the dog that caused the problem and, finally, what was done to solve it. This has the twofold purpose of keeping the dog as well as to help the owner.

Three dogs will be on exhibition. All are typical cases of bad behavior problems, now recovered.

Clinical Aids Panels

F. T. Candlin, D.V.M., Denver, Colorado; C. L. Blakely, D.V.M., Boston, Massachusetts; C. H. Covault, D.V.M., Ames, Iowa; G. J. Lawhon, Sr., D.V.M. Hartsville, South Carolina; W. C. Glenney, D.V.M., Ardmore, Pennsylvania; E. C. Jones, D.V.M., Los Angeles, California.

M. A. Thom, D.V.M., Pasadena, California; E. P. Leonard, D.V.M., Ithaca, New York; H. E. Jensen, D.V.M., Cleveland, Ohio; H. F. Wilder, D.V.M., Buffalo, New York; D. A. Eastman, D.V.M., Miami, Florida; J. R. Currey, D.V.M., Washington, D. C.

Each panel member will discuss his favorite clinical and surgical procedures in five minutes or less. Movies and slides may be shown.

Panel on Heartworms

R. F. Jackson, D.V.M., J. H. Yarborough, D.V.M., D. Y. Kirkpatrick, D.V.M., C. B. Dibbell, D.V.M., K. R. Owens, D.V.M., R. F. Minnick, D.V.M.

St. Augustine, Miami, Orlando, St. Petersburg, and Gainesville, Florida

These six practitioners will spend five minutes each answering ten fixed questions:

1) How extensive are heartworms in house dogs and in hunting dogs kept out-of-doors?
2) What percentage do you treat?
3) Treated as out cases or hospitalized?
4) Interval between treatments?
5) Length of total treatment period?
6) Percentage of successful treatments?
7) Method of diagnosis?
8) Drug used; how long have you used it?
9) Method of selecting cases for treatment?
10) Is incidence increasing or decreasing?

Since the answers will be brief, any attempt to summarize them would be futile.

There is every assurance that the subject will be covered amply, but that the discussion will continue for weeks and months after the panel presentation.

Panel on Distemper

L. W. Goodman, D.V.M., Manhasset, New York; P. C. McLain, D.V.M., High Point, North Caroline; J. E. Greene, D.V.M., Auburn, Alabama; T. P. Rowe, D.V.M., Richmond, Virginia; H. H. Groth, D.V.M., San Mateo, California; S. W. Haigler, D.V.M., St. Louis, Missouri

Each of these six practitioners will take five minutes to answer 11 fixed questions on canine distemper.

1) How extensive in your practice?
2) Your immunizing routine for healthy pup?
3) Routine on heavily parasitized pup?
4) How effective is immunity two months later?
5) Can vaccination be trusted one year later?
6) If hospitalized, how handle this dog?
7) How frequently does nervous involvement follow distemper-like symptoms?
8) How do you handle nonvaccinated surgical patients hospitalized overnight? For one week?
9) Routine for vaccinated surgical patient?
10) What age are distemper injections started?
11) Can puppies be raised in your hospital?

Section on Public Health

Standard Operating Procedure for Veterinarian at Air Force Base

Major John R. Nettles, USAF, V.C.

MacDill Air Force Base, Florida

The base veterinarian is responsible to The Surgeon and the Base Commanding General for conducting the veterinary service at this Base in accordance with air force regulations, army regulations, regulations and directives of the U. S. Public Health Service, and other applicable regulations.

The base veterinarian's duties and responsibilities incurred by virtue of his commission as a veterinary officer of the U. S. Air Force and his assignment are three-fold in character: professional, advisory, and administrative.

United States Air Force Veterinary Service

Colonel Wayne O. Kester, USAF, V.C.

Washington, D.C.

The United States Air Force, ever known for its constructive and progressive thinking and action, established a Veterinary Corps in July, 1949. This action came as no surprise to the well informed who are aware that the veterinarian, by virtue of his professional training in disease prevention and control, food hygiene, nutrition, sanitation, and related subjects, is eminently qualified to render an important service in the field of preventive medicine and public health vital to any modern military organization.

Our present day Air Force requires the combined efforts of more sciences, specialized groups, and professions than any comparable organization the world has ever seen. The science of veterinary medicine has a very definite place on the Air Force team. Its primary purpose being to apply veterinary medicine in the betterment of human health —specifically the health of the Air Force—it is rightly grouped with medical and allied sciences and its efforts are directed chiefly in the field of preventive medicine.

Its first and primary function in the traditional role of military veterinary medicine is to assure that all food consumed by the Air Force is sound, wholesome, and of proper quality. This includes all types of foods and it is food hygiene applied in its broadest concept. With numerous widely scattered bases, especially in foreign countries, this is no small responsibility.

Of concern are diseases of animals, especially those which may affect man. The continual possibility of a globe-hopping plane introducing diseases from other countries has caused all Air Force veterinarians to regard themselves as on the front line quarantine in safe-guarding the nation's livestock industry. Animals owned and used by the Air Force, as well as problems in connection with the air transportation of animals, also require attention.

Research in many subjects is indicated; however, the greatest immediate opportunity for achievement lies in the translation of existing scientific knowledge and its practical application to the everyday needs of the Air Force.

Veterinary Epidemiology

B. H. Dean, D.V.M.

Berkeley, California

The veterinarian engaged in public health work is responsible for planning and initiating the veterinary medical aspects of programs directed toward preventing the transmission of animal diseases to man. All of these activities must be coördinated through the proper channels of the Public Health Veterinary Unit of Acute Communicable Disease Service.

The activities of such a veterinarian are carried on through several channels: (a) stimulate private veterinarians to report animal diseases communicable to man; (b) supervise epidemiologic investigation and obtain laboratory specimens for diagnostic purposes; (c) operate short-term field studies; (d) operate research programs; (e) diagnose diseases and recommend programs for prevention and control; (f) supervise public health programs involving rabies, brucellosis, psittacosis, and equine encephalomyelitis; (g) act in a liaison capacity between the state department of public health, state department of agriculture, school of veterinary medicine, private veterinarians, and veterinarians of other agencies; (h) advise and consult with other sections of state department of public health; (i) and coördinate all activities of the department of public health relating to diseases of animals affecting man and other veterinary medical problems.

Communicable Disease Problems Associated with Florida's Brucellosis and Tuberculosis Programs

C. L. Campbell, Jr., D.V.M.

Tallahassee, Florida

Within the past year and a half, Florida has accelerated its campaign in the eradication of both brucellosis and tuberculosis through the coöperative efforts of veterinarians, public health organizations, and other livestock interests concerned with eliminating these diseases. As a result, there is now an increasing consciousness of security from bovine infection in a large percentage of the citizens of the state, which attitude, through instituted educational policies, is gradually replacing the pseudo-complacency which has existed toward these diseases for some years.

As the antipathies which exist at times between the interests representing the livestock industry are dispelled entirely, we will be in a much better position to completely wipe out these two dangerous threats to human and animal health. Only through the coöperative efforts of all whose subsistence is dependent upon the health of the nation's livestock may brucellosis and tuberculosis be eradicated.

Creeping Eruption in the Southeastern United States

Alan W. Donaldson, Sc. D., James H. Steele, D.V.M., M.P.H., and James E. Scatterday, D.V.M.

Atlanta, Georgia, and Jacksonville, Florida

Results of a questionnaire submitted to physicians throughout Florida indicated that cases of creeping eruption occurred in far greater numbers than anticipated. As a result of this information, a coöperative study between the Florida State Department of Health and the Communicable Disease Center (USPHS) was begun, which has involved the gathering of information regarding the incidence of creeping eruption throughout the southeastern United States and, more particularly, the determination by the examination of autopsy material of the incidence of infection with *Ancylostoma brazilienze* in dogs and cats in the southeastern United States, particularly in Florida. Studies are also under way regarding the possible use of various chemicals as soil larvicides in the control of the dog hookworm. The desirability of, and suggestions for, future investigations are discussed.

Rabies Control

K. S. Young, D.V.M.

Austin, Texas

Rabies control requires control of the biting animal. Vaccinate dogs, eliminate stray dogs, and eliminate a sufficient number of wild, biting animals such as foxes and skunks so that the chain of passing the rabies virus from one animal to another within their normal range will be broken. Intensify wildlife control efforts when wildlife rabies occurs near large, dog populations. Rabies will kill 75 to 95 per cent of all biting wildlife where it occurs. Rabies vaccination of dogs is 98 per cent effective under field conditions.

Publicize differentiation of the incubative and infective periods. It is a disease of the nervous system. Exposure is from direct contact with foxes, dogs, and all biting animals and treating cases of dumb rabies in livestock. It is impossible to differentiate dumb rabies from colic in livestock, in its early stages. Where humane departments hamper efficient control, create a humane department within the police department. The solution to the whole problem is educational and is the essence of simplicity. Have veterinarians immunize dogs by vaccination and lower the wildlife population where rabies exists, and the disease is whipped. What we need to do is carry this message to the public.

Tropical Diseases of Public Health Importance

Willard H. Wright, Ph.D., D.V.M.

Bethesda, Maryland

A large number of tropical diseases are related to the field of veterinary medicine by reason of the fact that their etiologic agents have reservoir hosts in lower animals. This circumstance adds to the complexity of the epidemiology, epizootiology, and the difficulty of control. A causal compilation indicates that there are over 50 such diseases in this category. The causative agents are representatives of all classes of disease-producing organisms. Many of these diseases constitute formidable public health problems in many parts of the world. In other cases, assessment of the importance is difficult because of lack of knowledge concerning distribution, epidemiology, epizootiology, and frequency of occurrence.

It is proposed to discuss in some detail the veterinary medical aspects of public health importance of certain of these diseases. Some of the protozoal diseases are of major significance in this regard. These include cutaneous and visceral leishmaniasis, African sleeping sickness, Chagas' disease, and possibly toxoplasmosis. Helminthic diseases in this category comprise oriental schistosomiasis, echinococcosis, clonorchiasis, and creeping eruption.

Although reservoir hosts are not generally involved in the epidemiology of tropical bacterial and spirochetal diseases, they are important in certain cases. Brucellosis is of concern in certain tropical areas. Leptospirosis is probably more widespread in the tropics than present records indicate. Tick-borne relapsing fever is highly endemic in certain areas. Sylvatic plague is a threat in some countries.

Yellow fever maintained in jungle reservoir hosts constitutes a constant threat to urban areas. Rabies is widespread in many tropical countries, and its control is complicated in certain localities because of transmission by the vampire bat. Many types of encephalitis of unknown etiology occur in tropical countries, although little research has been conducted in such countries and our knowledge of the encephalitides is confined mostly to the forms which have been studied in the temperate zones. Psittacosis and Rift Valley fever are always potential threats to man.

Certain rickettsial infections present important tropical public health problems. Endemic or murine typhus is widespread and the tick-borne spotted fevers flourish in tropical lands.

The field of the veterinarian in public health in the tropics will soon present a wide range of opportunities never before available. With the formulation of the ECA and Point Four assistance programs to backward areas, the American veterinary medical profession will no doubt be called upon to furnish many qualified individuals to engage in a variety of projects.

Salmonellosis in Dogs in Florida

Mildred M. Galton, M.S., H. B. McElrath, M.S., and A. V. Hardy, M.D.

Jacksonville, Florida

Brief mention of previous studies concerned with canine salmonellosis was made. The procedure used in the isolation and identification of Salmonella during this study was outlined. The findings concern the isolation of Salmonella from over 3,000 fecal specimens from dogs in different areas of Florida during an eleven-month period. The groups examined included pound dogs, animals in boarding kennels, veterinary hospital dogs, and Greyhounds. Prevalence of infection varied from 0 to 100 per cent.

The highest percentage of isolations was obtained from Greyhounds in the presence of "kennel sickness." In some kennels, apparently normal dogs yielded a high percentage. Among dogs in which Salmonella infection was epizoötic, one type usually predominated. The appearance of multiple types was common. In two instances, four types were isolated from 1 animal. During this study, over 30 different types were isolated. Kennel sickness as a clinical entity, and its relation to salmonellosis in dogs, is discussed. The sen-

sitivity of Salmonella to various sulfonamides and antibiotics was tested *in vitro*, preparatory to future experimental therapeutic studies in animals.

Graduate Veterinary Public Health Courses —An Urgent Need

Franklin A. Clark, B.S., D.V.M.

Auburn, Alabama

Graduate courses for qualified persons in all professional groups of the public health team have been provided in the United States, except for veterinarians. The need for such training for veterinarians who hold or wish to qualify for administrative and supervisory positions in public health is urgent. Such training should preferably follow two or more years experience in two or more veterinary activities of a health program. It should include basic courses in public health administration and organization, epidemiology, sanitation, and possibly public health education and statistics; and advanced courses in meat and milk inspection and rabies control, epizoötiology of the animal diseases of public health importance, veterinary parasitology and entomology, bacteriology and immunology, and the organization and methods employed by official livestock disease control agencies for these diseases of public health significance. All of the courses, except possibly the first group, should be designed especially for veterinary students and most of them should be taught by experienced public health veterinarians. The degree conferred should be master of veterinary public health.

The State Public Health Laboratory and Veterinary Public Health

Albert V. Hardy, M.D.

Jacksonville, Florida

The inter-relationship of infectious diseases in man and animals is reviewed. The major function of state public health laboratories is to aid in the control of diseases communicated from man to man or animals to man. The services now available to aid physicians in the diagnosis of infectious diseases of man need to be made more readily available to veterinarians so they may more accurately identify infectious diseases in animals. Bacteriologic studies are best performed in laboratories located near the person or animal being examined. In general, the public health laboratories are so located that service is readily accessible in all localities. For reasons of convenience, efficiency, and economy, there is clear justification for expanding in public health laboratories the services available to veterinarians.

The rich opportunities for productive studies in the field of veterinary public health are illustrated. To study adequately the problems of communicable diseases of human beings, more attention must be given the possible reservoirs of infection in animals and birds.

The Use of Avianized Antirabic Vaccine on a County-Wide Basis

A. L. Stafford, D.V.M., and L. E. Starr, D.V.M., Ph.D.

Atlanta, Georgia, and Plant City, Florida

Jasper County is a typical rural county with a total population of approximately 9,000 people and 15,000 cattle. There are 849 farms on which 616 dairy herds of various sizes are maintained. The dog population is estimated at 1,800 and wild foxes at 1,000.

In 1945, Jasper County experienced a severe outbreak of rabies in which 364 cattle, 122 mules, 36 dogs, and innumerable foxes died of the disease. A total of 1,600 dogs were immunized with commercial brain tissue vaccine and 675 foxes destroyed.

A mild outbreak of rabies in foxes occurred late in the summer of 1949. Because of the fear of another enzoötic, the County Board of Health decided to immunize all the dogs free and discontinue the fox bounty.

Between Oct. 14, 1949, and Nov. 5, 1949, a total of 1,781 dogs were immunized at clinics and in the veterinarians' offices with "avianized" vaccine. All expense of operating clinics was paid by the County Department of Health. There were no deaths or other incidents which could be attributed to the live virus. One dog developed a mild edema of the eyes and nose on the third postvaccinal day which may be attributed to an allergy to egg albumen.

Nine dogs were exposed to a rabid fox, some being bitten severely, fourteen days following immunization. These dogs are normal to date.

Municipal Meat Inspection

H. G. Bailey, D.V.M.

Savannah, Georgia

The reason for competent meat inspection is simply to give the consumer a wholesome food-animal, free of disease, and meat-food products safe and free of contamination.

Federal meat inspection (BAI) has a long, enviable record of efficient work beneficial to public health. It has the thorough confidence of the consumer, and has developed a pattern well worth the attention of state and city health departments. Since the scope of this work doesn't extend to all slaughtering of animals for sale within state boundaries, cities, and towns, it is safe to estimate that at least 35 per cent of the meat consumed in America receives inadequate or no inspection.

Who should bear the burden of meat inspection, the state or the city? At various times, state

departments of health or agriculure have realized their obligations to the public in this matter but have failed to set up the machinery for an extended health measure. The usual excuse is lack of funds, budget appropriations, or just plain indifference. However, California, Colorado, and Kansas, have met their responsibility in the matter of state meat inspection. The last resort is municipal meat inspection.

Local food-control officials have long realized the need of efficient meat inspection. Getting legislation passed and the machinery set in motion for carrying out this health safeguard is not an easy task. It often embodies health educational work, manipulation of budgets, employing graduate veterinarians, and the support of the community. An unguarded local meat supply leaves the consumer exposed to many hazards and unethical practices of food handlers.

The armed forces are big consumers of meat that is safeguarded by inspection, usually federal, and no serious widespread outbreaks of disease traceable to the issue of unwholesome meats and meat products have occurred among the armed forces.

Meat inspection should be extended until the civilian has as complete meat protection as is afforded the military personnel. Getting and maintaining municipal meat inspection is a local problem, squarely on the shoulders of the health officer and his food-control officials. They are the how, when, and where.

This accomplishment usually is responsible for an increased consumption of meat by the confidence it has inspired in the product. This benefits the producer and the general public. It tends to stabilize the local meat industry.

Section on Poultry

Poultry Diseases—A Clinical Subject

E. F. Thomas, D.V.M.

Athens, Georgia

Poultry diseases in the past have been taught in the classroom and laboratory but practically ignored in the clinical courses. Such a method of teaching poultry diseases has failed to give the graduate veterinarian the proper knowledge of the subject, which is manifested in the practitioner by his lack of confidence in diagnosing diseases of poultry and prescribing for them.

The teaching of poultry diseases in the classroom and laboratory must be supplemented by making it a clinical subject. We have recognized the necessity of giving students clinical experience in all other animal diseases. Poultry diseases should never have been an exception.

Practicing veterinarians cannot justifiably criticize the poultryman for seeking advice from other sources when they have shown so little interest in his problems. Much of this lack of interest has been due to lack of knowledge. When a veterinarian can handle poultry diseases with the same confidence as diseases of other animals, the poultryman will recognize his skill and knowledge. Then and then only will the two meet and find a mutual interest.

The School of Veterinary Medicine, University of Georgia, is fortunate to be located adjacent to the third largest broiler-producing area in the United States. This tremendous poultry population and the many breeding farms near Athens will give this school a large potential poultry clinic.

In the clinic, we will endeavor to accomplish the following:

1) bring the veterinary student and poultrymen together.
   a) by having ambulatory clinic visit poultry farms to investigate diseases of poultry.
   b) by having poultrymen bring sick birds to to the hospital clinic for diagnosis and treatment.
2) teach the student to make poultry disease diagnoses on the farm.
   a) by gathering history from the poultryman; making examination of individual sick birds; studying the whole flock; and by field autopsies.
   b) by selection of birds and specimens to present to the laboratory.
3) teach the student to prescribe and administer treatment.
   a) a suitable stock of poultry drugs and biologics will be carried in the clinic pharmacy.
4) reproduce many of the infectious diseases of poultry for the student to observe their development.
   a) by using isolated wards prepared for such flocks.
   b) by immunizing part of these birds in order that students will observe the use of biologics.
5) coördinate the poultry pathology laboratory and clinic.
   a) by having students follow up the laboratory findings.

b) by making necessary changes in recommendations for the control of disease in the flocks when laboratory findings change the tentative field diagnosis.

Laboratory and Field Studies of Newcastle Disease Vaccines

Charles R. Davis, D.V.M., M.S., I. M. Moulthrop, D.V.M., and Reginald Reagan

College Park and *Salisbury, Maryland*

With the rapid turnover of poultry populations, especially in the broiler area, and the importation of thousands of chicks into Maryland, Newcastle disease soon spread to many poultry plants in the state. The demand for a vaccine against this disease was so great that it was decided to let the grower use any type he desired.

Millions of chickens, ranging in age from day-old chicks to adult birds, on hundreds of farms, have been vaccinated with both killed and live virus vaccines from various sources. The results have shown wide variation.

Turkey Disease Problems in Texas

W. A. Boney, Jr., B.S., D.V.M., M.S.

College Station, Texas

Texas has no new turkey diseases, but seems to be blessed with all of those that have previously been described.

Each year many problems presented by beginners, are due to faulty management, such as insufficient light, water fountains, feed plates, and troughs, and the abrupt change of type of water fountains and feed troughs. In many instances these practices lead to starvation.

Coccidiosis is still a problem, but not as great as hexamitiasis. Hexamita infections are often found on farms where breeder turkeys are also kept.

During the growing period, blackhead is occasionally responsible for some mortality, but due to the large ranges there is often more botulism seen. In finishing lots, upper digestive tract trichomoniasis often causes a severe economic loss as well as scattered mortality.

Leucocytozoön and hemoproteus infection are common, and in certain instances a leg weakness associated with them, is not unlike the multiple nutritional deficiencies.

Last season was our first year to observe, on a large scale, infectious sinusitis in turkey poults less than 4 weeks of age. Research at this station has not shown that the infection is transmitted through the egg. Streptomycin effects rapid recovery.

Fowlpox is always present but is not a difficult problem.

Newcastle disease in poults has been diagnosed only once in turkey poults.

Acute fowl cholera and swine erysipelas are encountered three or four times each year. Penicillin and aureomycin effected a rapid cure in my finger which was infected with the erysipelas organism as the result of performing an autopsy on an infected turkey. We have our share of external and internal parasites, mostly lice, blue bugs, and ascarids.

Those infections due to certain species of Salmonella continue to receive our utmost attention. Pullorum disease is no great problem, since the majority of our breeder flocks are "U. S. pullorum clean." However, certain species of paratyphoid organisms are being isolated more frequently, and do present a serious threat, since a testing program for paratyphoid can not adequately be put into effect.

Fowl typhoid is our most dreaded egg-transmitted disease. However, research at our station has shown that proper concentrations of sulfaquinoxaline will control acute outbreaks of the disease and hold the mortality to a minimum, thus giving the owner of an infected flock a chance to find a desirable market for them.

Radioisotopes in Poultry Research

C. L. Comar, Ph.D., and O. E. Goff, Ph.D.

Oak Ridge and *Knoxville, Tennessee*

Radioistopes of the following elements are now available for use in poultry studies: phosphorus, calcium, potassium, sodium, iodine, sulfur, iron, manganese, cobalt, zinc, and carbon. Many of the essential organic compounds are also obtainable with a radioactive label, but have not been extensively used.

Some of the studies along this line which have been reported or are now underway include: (1) use of P 32 to study formation of yolk material and developing embryo; (2) use P 32 and Ca 45 to study the utilization of these elements from poultry rations and the mechanism of egg formation; (3) use of I 131 to study thyroid function in the bird; (4) use of P 32 to label the virus in an infected egg; and (5) utilization of Ca 45 and P 32 in birds showing lesions of osteopetrosis.

Poultry Disease Diagnosis in the Laboratory

Clement I. Angstrom, D.V.M.

Kingston, New York

The function of a poultry disease diagnostic laboratory is to promote disease control in the area. It must therefore serve as a source of correct diagnoses of poultry diseases and intelligent, useful recommendations which the poultryman can and will implement.

Toward this end, a knowledge of poultry dis-

eases in the area and suitable specimens for examination are helpful, but a good case history is indispensable. All stains, rapid plate tests, fresh preparations, and other tests which can be made at the time of the examination must be utilized. Bacteriologic cultures, virus isolations, immunity tests, and similar procedures should be used for diagnostic or confirmatory purposes.

Circumstances such as the importance of an exact diagnosis, the relative significance of the presence of certain disease agents, the usual prognosis of the case involved, current market prices of poultry meat or eggs, the human element, and many similar factors must be considered in effective poultry disease control work.

Intestinal Parasitism and Poultry Production in the South

A. C. Todd, M.S., Ph. D.

Lexington, Kentucky

The species of parasites which have been found most injurious to poultry in the South are the roundworms, tapeworms, and coccidia. All of the 14 species of roundworms and ten species of tapeworms reported in chickens in the United States occur in the South, and at least four of these helminths have been reported from no other region. All but one of the recognized species of chicken coccidia enzoötic in the United States have been reported in the South. There is evidence that chickens in the region sustain near universal exposure to infection and that rates of infection, both in species and numbers, exceed those in other regions. Rates and levels of infection are related in part to climatic conditions, but also to methods of management and to the breeds of chickens employed in production.

The trend to dual-purpose breeds of chickens for egg production and adoption of crossbreds for broiler production apparently will influence parasite populations. It is expected that certain strains of heavy breeds, and particularly hybrid strains, will tolerate greater levels of infection. The developments will require more efficient methods of management and sanitation for the prevention of exposure of chicks.

The Public Health Aspects of Poultry Diseases

W. L. Ingalls, D.V.M., M.Sc.

Columbus, Ohio

Information is compiled and presented on the various diseases of poultry which are common to man and fowl and that may have possible public health significance. Some of the conditions are relatively uncommon; however, they have been observed in both man and poultry. In some cases, fowl are not visibly affected and may act only as transient carriers; whereas, in other conditions there may be heavy losses or visible sickness in the birds. One disease not commonly found in chickens but incriminated as a possible occupational hazard among poultry workers is also considered. This condition, leptospirosis, has been found to be associated with the poor hygienic conditions around poultry-dressing plants in at least one area in the United States.

The diseases of poultry which human beings may acquire are classified as to cause: (1) viral (eastern encephalomyelitis, western encephalomyelitis, St. Louis encephalitis, Japanese B encephalitis, Newcastle disease, psittacosis (ornithosis), and rabies; (2) bacterial (erysipelas, listeriosis, salmonellosis, staphylococcosis, streptococcosis, tuberculosis, tularemia, diphtheria, and brucellosis); (3) fungus (aspergillosis, favus, thrush, sarcosporidiosis); (4) parasitic (toxoplasmosis, echinostomiasis, schistosomiasis, *Dermanyssus gallinae* infestation); and (5) toxins (tetanus and botulism).

In some of the cases, there is a question whether the same specific cause is involved in birds and human beings. The significance of each condition is considered, and a summary of the public health aspects of poultry disease is made.

Challenging Problems and Opportunities in Poultry Disease Research

E. P. Johnson, D.V.M., M.S., Ph.D.

Blacksburg, Virginia

Twenty years ago, very creditable research could be done by individuals who were only moderately well trained as compared with the majority of present research workers, in laboratories that were often inadequately equipped, and under conditions that would be most discouraging at the present time. A few slides, pipettes, Petri dishes, test tubes, a microscope, and perhaps a microtome constituted the equipment usually available. With this type of setup, it was only possible to make substantial contributions in diseases of bacterial and parasitic etiology and observations on gross and microscopic lesions. It follows, therefore, that the earlier contributions were made on such diseases as cholera, pullorum disease, fowl typhoid, histomoniasis, and coccidiosis. Under such circumstances, it is not difficult to understand why it took a long time for the viral etiology of the leucosis complex to become substantiated and placed on a basis that would satisfy the requirements for the group of diseases caused by these important agents. It appears, therefore, that the laboratories best equipped to handle virus diseases under controlled conditions, and staffed with adequately trained personnel, are the ones where greatest progress can be expected in the future. Moreover, basic research to establish fundamentals will be more important in the

future, and any substantial progress will depend on the requirements mentioned.

In the past, research workers in poultry diseases have given but cursory attention to any possible relationship of these to human diseases. More recent observations on the Salmonella infections, encephalitis, encephalomyelitis, Newcastle disease, and others, indicate that much more attention should be given to the possible relationship of many of these to public health. In addition, the researcher in avian diseases will be in an enviable position to make fundamental contributions to such important problems as cancers and leucemias of human beings.

The most important contributions in the future will no doubt come from groups attacking problems simultaneously. This is well exemplified by the regional attack on Newcastle disease. Chemists, geneticists, nutritionists, and others, should be encouraged to join us on certain phases of our disease problems. A most important step would be to encourage the development of strains of birds that are relatively resistant to, and free from, leucosis in sufficient numbers, so that they would be available to the workers on the leucosis problem, and others. More work should be undertaken to determine the relative safety of eggs from various sources for vaccine production.

Techniques for Bacteriologic Examination of Reactors to Pullorum Disease Antigen

E. Jungherr, Vet. Dipl., D.M.V., W. J. Hall, D.V.M., and B. S. Pomeroy, D.V.M., Ph.D.
Storrs, Connecticut, Beltsville, Maryland, and St. Paul, Minnesota

As a subcommittee of the National Plans Committee on Standardization of Antigens and Procedures in Testing for Pullorum Disease, of the Northeastern Conference of Research Workers, the authors propose the following technique as a minimum standard for the bacteriologic examination of pullorum reactors: culture pericardial sac, peritoneum, and oviduct on beef-extract agar slants by means of sterile cotton swabs; culture whole ovary or its malformed parts, gall bladder, ileal contents, and pathologic cysts if present, in selenite broth for twenty-four hours and then streak on SS agar and bismuth sulfite agar. Subculture suspicious colonies on agar slants, check for indol and urease production, motility, gram-staining reaction, agglutinability in known *s* and *x* pullorum antiserums, and fermentation in carbohydrate broth containing dextrose, lactose, maltose, and sucrose, respectively. The recommendations have been evolved on the basis of consultation with experienced laboratory workers in pullorum disease control and data accumulated in the University of Connecticut Pullorum Disease Control Laboratory.

AVMA President to Be Featured on National Farm Hour

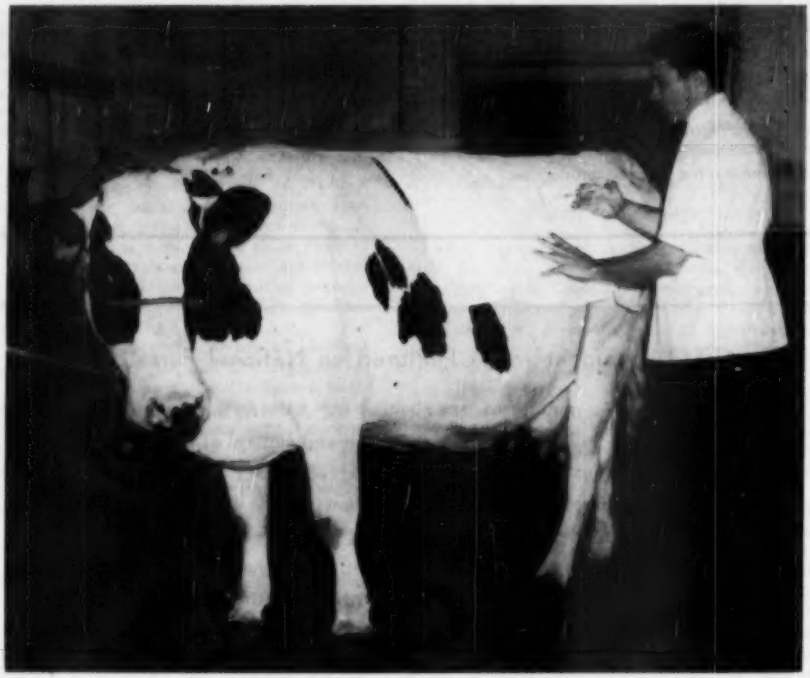
Dr. W. M. Coffee, now president-elect of the AVMA, and two or more other association officials, will discuss the prevention and control of mastitis on the National Farm and Home Hour (NBC) Aug. 26, 1950. For the second consecutive year, the National Farm Hour program, following the AVMA convention, will broadcast interviews with AVMA officers and members at the convention. About ten minutes of the half-hour program, reputed to be the farm program with the most listeners, will be devoted to mastitis, with Dr. Coffee leading the discussion. Consult your local NBC station schedule for the hour this program will be broadcast.

SURGERY & OBSTETRICS

AND PROBLEMS OF BREEDING

Egg-Transfer Breeding in Cattle

The National Egg-Transfer Breeding Conference sponsored by Foundation for Applied Research, San Antonio, Texas, on April 14, 1949, reported a revolutionary biologic experiment, an ova transplantation project. Looked upon as a wild dream in the past, there now seems to be a prospect of egg-transfer and superovulation which will enable fertilized ova from selected matings to be transplanted from the Fallopian tube or the uterus of the cow to the uterus of any other receptive cow—even a grade or a scrub—and permit the latter to carry the transplanted fertilized ovum to term and then deliver the calf conceived to the original mating. At present, the plan works through the early stages, but no calf has yet been produced in this manner. How-



In ova-transplantation laboratories of the Foundation of Applied Research on the Essar ranch near San Antonio, Texas, Mr. Raymond Umbaugh, research associate in biology prepares to make an ova transfer from a cow as one step in an extensive project seeking to permit birth of first-class, high quality calves from ordinary scrub cows.

In direct charge of the project, Mr. Umbaugh has conducted a seven-year experiment for the Foundation involving 750 head of cattle. Pregnancies have been obtained, but no calves have yet been born. The project was transferred from Worcester, Mass., to the Foundation laboratories in Texas.

ever, Drs. B. L. Warwick and R. O. Berry, Texas A. & M. College, have obtained a lamb through egg-transfer methods.

Two techniques are used in making the egg transplant. One method collects the eggs by dilating the cervix and washing out the lumen of the uterus. This method was developed by Drs. W. E. Petersen and Arthur Dracy at the University of Minnesota. The other method involves aspiration of the follicular fluid at a time shortly before ovulation would occur. After collection, the ova may be transferred by a flank insertion into the Fallopian tube, or through the dilated cervix directly into the uterus, of the recipient cow.

In addition, controlled superovulation is induced, as follows: Pellets containing 1,500 to 3,000 rat units of sheep pituitary extract were implanted subcutaneously into cows. Four days later, 1,000 rat units of sheep pituitary extract was injected intravenously. Twenty-six hours after the intravenous injection, the mature follicles are aspirated through a small abdominal incision. Approximately half of the follicles yielded ova, and the average number of ova recovered from both ovaries was 21. The procedure may be repeated in thirty-five days. [If this method becomes even 50 per cent effective, 10 ovulations a year and 10 calves per ovulation (5 heifers) would mean 50 female offspring in a single year. The quality of our dairy cattle could be improved rapidly under a program of this type.—ED.]

In our experience, 75 per cent of the bad cases of otitis media will require surgery sooner or later.—*R. J. Beamer, D.V.M., Iowa.*

Overfeeding during the puerperal period is believed to be an important factor in the high incidence of eversion of the uterus among milk buffaloes in India.—*J. Royal Army Vet. Corps, Dec.*, 1949.

Practicing veterinarians should be well acquainted with the artificial insemination technician serving their territory. By counselling and coöperating with technicians, better service can be rendered to the dairy cattle owners and more fertility problems will be referred to veterinarians.—*John B. Herrick, D.V.M., Iowa.*

Hoof Trimmers for Dehorning Calves

The long-handled hoof trimmers used on standing animals can also be used effectively to dehorn calves. A nose lead is used to swing the head first one way and

Hoof trimmers for dehorning calves.

then the other to permit blocking of the cornualis nerve on both sides. In a few minutes, the trimmers are applied, as shown in the accompanying picture, for removal of horns. Since a single stroke of the instrument will seldom do a complete job, a sharp knife is best used to cut loose remaining skin after the horn itself has been severed.

As can be seen, the trimmers permit excellent "shaping" of the head. They are advantageous chiefly on horns too small for regular horn clippers, and have the advantage of making dehorning a 1-man job. They are faster and easier to use than a saw, but are not recommended for use on animals more than 1 year old.—*J. W. Bailey, D. V. M., Fort Atkinson, Wis.*

Ovine Anesthesia.—Sodium pentothal is a satisfactory anesthetic for sheep undergoing experimental surgery (*Austral. Vet. J.*, Nov., 1949). Dosage depends entirely upon the effect, there being no standard dose rate. Picrotoxin, metrazol, and carbon dioxide are effective antidotes for this thiobarbiturate.

Twins in Mares

No one has given an immutable explanation for the rarity of geminate gestation in mares nor why the termination is generally unfavorable. A glance into the literature reveals that only 1 out of 60 equine twins survive beyond parturition. Multiple ovulation, dual fecundation, and monochorionic fetation are rare in mares, but that does not account for the hazard that somehow

—From Recueil de Medecine Veterinaire

A 16-year-old Brittany mare and her offspring—a mule and a horse foal, born March 27, 1948, after being served by a jack on March 30, 1947, and a stallion April 3, 1947.

overtakes their twins, in view of the fact that superimposed fetation is reportedly more frequent in Equus than in other large mammals. The corpus luteum and the cervical seal do not always block a second conception as the accompanying picture testifies.

The birth of a mature fetus, together with a less mature one due to the fecundation of an ovum in an already pregnant mare, is mentioned by all competent authors on veterinary obstetrics. The two-service theory is, of course, proved when the one is a horse and the other a mule foal, and the dam was known to have been served by both a stallion and a jack during the same, or probably subsequent, heat period.

Quoting Leroy and Pechdo (*Recueil de Médecine Vétérinaire*, Jan., 1950), "Bournay and Robin reported the case of a mare, 14 years old, served by a jack on March 18, 19, 25 and April 1 and 8, 1890, and by a stallion on May 8, that gave birth eleven months later to first a mule and then to a horse foal.

"Mumford cites three instances of superfetation in mares covered by stallions and jacks:

"A mare covered by a stallion and thirty days later by a jack to a mule and horse foal, stillborn.

"A mare, bred to a stallion in May and a jack in August (while in heat), delivered in January a mature horse foal and an undeveloped mule foal.

"Finally, a mare bred to a stallion Aug. 25, 1909, and to a jack May 20, and again June 12 to a stallion gave birth to fully mature twins, the one a future mule and the other a promising horse."

The mule-horse superfetation is an interesting point of reproductive physiology. It has its counterpart in mares served by two stallions at different times.

Pentothal-Procaine Combination

Intravenous injection of a combination of procaine hydrochloride and pentothal for all types of operations in connection with single injection spinal analgesia, with inhalation anesthesia, and alone as an analgesic in certain operations when relaxation was not required has given highly favorable results. The mixture to be used must be prepared carefully, however, because at certain dilutions the two drugs are incompatible.

The last pigs born are more likely to be dead than the first ones, and this is especially true in prolonged farrowing. This would indicate that possibly a delayed or prolonged farrowing period is an important factor in the number of live pigs farrowed. —*L. M. Hutchings, D.V.M., Indiana.*

Male mink that are extremely rough—known as killers because they have killed females while mating—can be used successfully for breeding by snipping off the ends of the canine teeth.—*T. T. Chaddock, D.V.M., Wisconsin.*

Peak fertility for bulls was reached by Holstein-Friesians in March and April, by Guernseys in October and November, according to a three-year study of records of the Michigan Artificial Breeders' Association.—*R. C. Lewis, B. S., Michigan.*

The first consideration in sperm fertility is to get a large proportion of strong, vigorous sperm in the semen at the time of collection.—*E. W. Swanson, Ph.D., Tennessee.*

Anesthesia for Zoo Animals

Chloroform in 1-lb. cans is used to subdue lions and other large animals for surgery on the feet and legs (such as ingrowing toenail). The patient is coaxed into a "shifting den," 4 by 4 by 8 ft. After the den opening is covered with a tarpaulin, chloroform is quietly squirted on the floor with a syringe. There is no commotion, and after the fourth can has been emptied, the animal becomes wobbly and slumps to the floor. Then, chloroform-saturated cotton on a 5-ft. stick is held close to the nose, and the animal loses consciousness within a few minutes. The affected leg is then extended from the den into the cage, the necessary treatment given, and the animal moved back to its cage. It usually recovers its equilibrium within an hour and starts to eat.

For deer, a large shipping crate is used instead of the "shifting den," chloroform being applied as for lions. A local anesthetic or ether is preferred for pinioning in birds. Morphine is the anesthetic of choice for the canine species, while nembutal is most satisfactory for medium and small feline animals.

Skilled use of anesthetics makes life easier and safer for zoo attendants as well as the animals, because the patient has no revenge-inspiring memory of what happened. Elephants are not the only beasts that never forget. If you don't believe it, try operating on a lion's paw some time without an anesthetic.—*Condensed from an article by J. A. Campbell, D.V.M., C.M.Z.S., in Parks and Recreation, Dec., 1949.*

Care must be taken in feline surgery not to get the subcutaneous fat between the edges of the incision.—*W. F. Erwin, D.V.M., Oklahoma.*

Infertility in cattle represents a disturbance of function which can be restored only following correction of any infection and inflammation present.—*H. E. Kingman, Sr., D.V.M., Wyoming.*

Whatever may be the importance of the barriers between mother and fetus in species having little or no placental permeability, lesions of the placenta may leave the path wide open for interchanges which influence infection and immunity.

Seminal Defect Causes Sterility

Describing work among 463 bulls of which 89 were Guernseys, J. L. Hancock and D. H. L. Rollinson report a seminal defect among 12 of the Guernsey bulls. In

—*The Veterinary Record*

Spermatozoa with only free heads and tails.

these animals, there was virtual absence of intact spermatozoa, the ejaculates containing only free heads and tails. The cause of the condition was not determined, but dietary and environmental factors are considered unimportant. An origin in genetics was suspected, but there has been no demonstration of close linkage of breeding among the 12 bulls although, in some of the herds, there was evidence of inbreeding (*Vet. Rec., 61,* [Nov. 5, 1949]: 742-743.)

Bilateral reduction of perineal hernias will often interfere with the innervation of the anal sphinter and incontinence in fecal elimination will result.—*M. W. Allam, V.M.D., Pennsylvania.*

The baby pig represents an actual investment of 140 lb. of feed at birth, 260 lb. of feed at 2 weeks of age, and 1,000 lb. of feed at weaning time. Such being the case, it is not consistent to continue to lose 40 per cent of the pigs between farrowing time and market age, of which 33 per cent die before they are weaned.—*L. M. Hutchings, D.V.M., Indiana.*

CLINICAL DATA

Clinical Notes

Pneumonia very commonly occurs with coccidiosis in calves.—*L. R. Davis, D.V.M., Alabama.*

Hens fed a ration containing 20 per cent casein transmitted a growth factor through their eggs to the chicks (*J. Nutr.*, Dec. 10, 1949). With soybean protein in the rations, the same effect was not observed.

The loss of 35 per cent of pigs farrowed before marketing may be largely ascribed to poor management practices on the part of the producer.—*F. M. Wilson, D.V.M., Iowa.*

The newborn pig represents an investment of at least $5.00 on the part of the owner, the newborn calf at least $25.00. Possibly these animals would be better cared for if the money were plainly visible.

Hydrated lime mixed in deep litter did not prevent the oöcysts of *Eimeria tenella* from sporulating, and was no more effective than deep litter alone in preventing coccidiosis, in experiments by F. R. Koutz (*Poult. Sci.*, 28, (Nov., 1948) :793-797.

We know of no better treatment for anaplasmosis than repeated transfusions of at least a gallon of blood daily. Fifteen grams of sodium citrate dissolved in 100 cc. of water should be placed in a gallon bottle before the blood is drawn.—*W. J. Gibbons, D.V.M., Auburn Vet., Winter, 1950.*

Preventive medicine in the atomic age requires the early recognition, prompt intervention, and absolute prevention of specific disease and the maintenance of health through periodic medical examinations, says Colonel W. C. Cox, M. C., in an item first published in *The Bulletin of the U. S. Army Medical Department* (Nov., 1948): 862-876.

There are no records which indicate that milk from rabies-infected cows is harmful to human beings.—*G. L. Dunlap, D.V.M., Missouri.*

Poultrymen use more drugs than any other livestock producer. They think they must have a medicant in the water.—*G. J. Cottier, D.V.M., Alabama.*

Shipping mink from a high altitude to a low altitude, and vice versa, seems to make them listless for a few days.—*T. T. Chaddock, D.V.M., Wisconsin.*

Salmonella singapore is reported as a new type of Salmonella. Its antigenic structure is 6, V1.VII:K-enx by Hayakawa and Sen (*Japan. M. J., 1,* [Aug., 1948]: 292-294).

Vitamin A Requirements for Turkeys.—On the basis of the growth data, plasma levels, and liver storage of vitamin A, the vitamin A requirement of growing turkeys was found to be 1,700 I. U. per 100 Gm. of feed.—*J. Nutr., Dec.* 10, 1949.

Of all chicken-feeding problems, 75 per cent are caused by farmers who buy concentrates and fail to mix them properly with their home grown grains.—*E. B. Ingmand, D.V.M., Iowa.*

Ca/P Ratio for Quail.—The Ca/P ratio for breeding Bobwhite quail was shown to be approximately 2.3 : 1 (*J. Nutr.*, Dec. 10, 1949). Diet levels of 0.75 per cent phosphorus and 1.8 per cent calcium appeared adequate for reproduction when gauged by all criteria except winter livability of offspring of birds fed these levels. Offspring of birds fed 1.00 or 1.25 per cent phosphorus survived winters much better. It is concluded that breeding Bobwhite quail requires diets furnishing approximately 1.00 per cent phosphorus and 2.3 per cent calcium.

Diagnosis of Liver Fluke Infection in Cattle

LEONARD E. SWANSON, B.S., D.V.M., and HOWARD H. HOPPER, B.S., M.S.

Gainesville, Florida

THE IDENTIFICATION of parasites in the living animal is an essential requirement in research and control methods of internal parasites. Enzoötic fluke-infested areas may be located by actual necropsy of suspected animals or through packing-house reports on slaughtered cattle. Individual animal infection, and even herd infection, is determined by microscopic examination of the feces for fluke ova. Liver fluke ova have a characteristic size, shape, and color which readily distinguishes them from other parasite eggs, making identification relatively easy. Liver fluke ova have an operculated shell and, unlike most other ova, can not be lifted without injury in solutions of high specific gravity. In such solutions, the fluke ova collapse, making identification difficult. The examination of fecal samples for fluke ova is facilitated greatly by separating fecal particles from the ova.

LITERATURE

Numerous textbooks, periodicals, bulletins, and other publications, give methods for microscopic examination of feces, urine, blood, and other materials for evidence of parasite infection. These writers, for the most part, have not been concerned with Trematoda eggs; consequently, it has become necessary to review the literature in hope of finding techniques applicable to examining bovine feces for liver fluke ova.

The earliest method of fecal examination is probably that of Grassi and Paroma[1] who in 1878 pointed out the value of fecal examination for the detection of hookworm infection by demonstrating the ova of these parasites in a simple smear.

Hall,[2] in his studies to develop a satisfactory method of examining feces for evidence of parasitism, tested many of the known procedures, especially those used in examining human feces. In this work, he used the smear, sedimentation, flotation, sieving, centrifuging, and other methods in attempting to concentrate the parasite ova. The technique and methods described in this paper aided materially in examination of bovine fecal materials for liver fluke ova.

Shaw and Simms[3] found that the use of heavy specific-gravity solutions resulted in the destruction of the fluke ova. They relied upon the simple smear method for diagnostic purposes in sheep and goats.

Alicata,[4] in drug studies in the Hawaiian Islands, used the sedimentation method for examining bovine feces for fluke ova. His methods are satisfactory in heavily infected animals, but are not entirely reliable in detecting light infections of liver flukes.

Olsen,[5] in drug efficiency and tolerance tests in controlling liver flukes in cattle, used methods similar to those of Alicata. His methods, like those of Alicata, were not always reliable in examination of feces from cattle having light infections. Furthermore, they are time consuming, and it is difficult to separate the ova from the fecal material by their use. Many other articles were reviewed; however, the authors were not concerned with liver fluke (Trematoda) infections, and their work was of value only from a standpoint of technical procedures.

To overcome some of the objectionable features encountered in the microscopic examination of bovine fecal material for liver fluke ova required development of new techniques. The purpose of this paper is to report on methods found most reliable and to assist others in their work under similar requirements.

MATERIALS AND METHODS

Liver fluke ova were obtained from bile acquired at local packing houses and from infected cattle slaughtered at the parasitology laboratory. Fecal samples were obtained from experimental animals. The sieves used in these experiments were sets of wire-cloth screens used in the analysis

---

Parasitologist (Swanson), Florida Agricultural Experiment Station; and graduate student (1949) in parasitology (Hopper), University of Florida, Gainesville.

Published with the approval of the administration of the Florida Agricultural Experiment Station.

of wet and dry material. The sieves consisted of 20, 40, 60, 80, and 100 mesh apertures to the linear inch and were 5 in. in diameter. Beakers of 2,000-cc. capacity were used, as the screens were of a diameter which would fit into these containers. A broad field, dissecting microscope was used in making ova counts and a fluorescent desk lamp used for illumination of the field. To make the fluke ova stand out in the field, various dyes which stained the ova or the fecal residue were used. In this work, after trying many different stains, it was found that Wright's stain, a 10 per cent aqueous solution of silver nitrate, or a 15 per cent tincture of iodine stained the ova satisfactorily.

Fecal samples from infected cattle and samples prepared by utilizing large numbers of ova obtained from bile fluid were passed through sets of sieves previously described. The size of the sample and amount of water used in washing were varied in each experiment to determine the safest procedure of sieving without removing ova from the sample. Residue remaining in each sieve was examined through a dissecting microscope for retained ova.

Screened samples were checked to determine the rate of fall of ova in large volumes of water. The rate of fall was observed by the use of a dissection microscope placed on its side and focused on a cylinder filled with water. Comparisons were made between the rate of settling of the ova and the fecal particles and also between the untreated ova and those treated to increase their weight.

Tests were run on decanting and siphoning of the supernatant fluid. When this supernatant fluid was poured or siphoned off by a straight glass tube, even though the end of the tube was an inch or more above the bottom of the beaker, many fluke ova were found in the decanted or siphoned solutions. A 1/16-in. bore glass tubing, with the end bent in a ¾-in. "U" shape to prevent sucking the ova from the bottom of the container, was then used. The long end of the tube, which was bent in a U shape, extended below the bottom of the beaker.

Fluke ova were treated with materials in an attempt to increase their weight, thereby causing them to fall more rapidly than did the fecal particles. These specimens were treated with 15 per cent iodine, alcohol, or water solutions of silver nitrate, and no difference in the rate of fall of the treated and untreated ova was obtained.

Although past work indicates that liver fluke ova can not be floated with any degree of accuracy, attempts were made to devise some means of flotation applicable to these ova. Solutions of varying specific gravity were prepared and checked with a hydrometer. In these tests, sodium chloride, sodium silicate, sodium nitrate, sodium hydroxide, calcium chloride, potassium iodide, zinc chloride, glycerol, sucrose, carbon tetrachloride, and hexachloroethane were used. All experiments in flotation of fluke ova were unsuccessful, as the ova were collapsed or the solution also lifted the debris.

Experiments to stimulate the flow of bile were conducted by the use of linseed oil given as a drench to several cattle. No material increase in ova output was observed. One animal, known to be heavily infected with liver flukes, was given 25 cc. of decholin sodium (sodium dehydrocholate) intravenously. The animal weighed 800 lb., and the treatment had no deleterious effect on her health. The fluke ova count was increased slightly; however, it was not considered of any material value in microscopic examination for fluke ova in cattle feces.

After many tests and experiments, the following procedure was found most accurate for examining bovine fecal material for fluke ova.

PROCEDURE

1) Collect a gross sample of 300 to 500 Gm. of feces from the rectum.

2) Place the sample in a 1,000-cc. beaker and mix thoroughly with a steel spatula in order to obtain an even distribution within the sample.

3) Take a 5-Gm. sample (small pieces from various parts of the gross sample) and place in a 250-cc. Erlenmeyer flask. Add 100 cc. of tap water and shake thoroughly, using a mechanical shaker, until an even suspension is obtained.

4) Wash the sample through a nest of screens, 20, 40, and 60 apertures to the linear inch. These screens are placed over a 2,000-cc beaker and the sample poured in and washed with a small hose. Wash the screens separately by removing each in turn and washing the ones below until 2,000 cc. of tap water have been used.

5) Allow the sample to settle for two hours, after which the supernatant fluid is siphoned off to within ¾ in. from the bottom by the use of a bent glass tube which siphons the fluid from the

top and does not disturb the sediment or ova on the bottom.

6) Pour the sediment into an Erlenmeyer flask calibrated to 200 cc. and add sufficient tap water to make the total 20 cc.

7) Thoroughly agitate the sample (do not whirl) and draw off four 10-cc. samples with a pipette and transfer to 15-ml. centrifuge tubes.

8) Centrifuge the sample for several seconds at 3,000 r.p.m.

9) Remove the supernatant fluid with a filter pump.

10) Stain the sample by adding several drops of 15 per cent tincture of iodine; allow to stand for five minutes; fill with tap water; centrifuge several seconds; and siphon off the supernatant fluid.

11) Transfer the sample to a 90-mm. Petri dish and examine under low power (18x) of a dissecting microscope. A glass plate scribed with parallel lines placed under the Petri dish facilitates making accurate counts and movement of the specimen dish.

12) The total number of ova found in the four dishes equals the number of ova per gram of feces.

SUMMARY

a) A simple efficient method of examining bovine fecal material for liver fluke ova is described.

b) Sieves of 20, 40, and 60 mesh allowed the fluke ova to pass on through and retained a great portion of the fecal materials.

c) Two hours settling of a sample is ample for the fluke ova to settle to the bottom of a beaker.

d) Pouring off the supernatant fluid or siphoning the material by a straight glass tube or hose removes many ova; whereas, the U-shaped tube does not.

e) Liver fluke ova can not be floated by the use of high specific-gravity solutions without rupturing the egg, thereby making identification difficult.

f) Staining of the ova aids in detecting and counting fluke ova in fecal examinations.

References

[1]Bibliography of Hookworm Disease. Pub. No. 11, International Health Board, Rockefeller Foundation, New York, (1878):13.

[2]Hall, M. C.: A Comparative Study of Methods of Examining Feces for Evidence of Parasitism. USDA Bureau of Animal Industry Bull. 135, (1911):1-36.

[3]Shaw, J. N., and Simms, B. T.: Studies in Fascioliasis in Oregon Sheep and Goats. Oregon Agric. Exptl. Sta. Bull. 266, (1930):1-24.

[4]Alicata, J. E.: Studies on Control of the Liver Fluke of Cattle in the Hawaiian Islands. Am. J. Vet. Res., *2*, (1941):152-164.

[5]Olsen, O. W.: Hexachloroethane-Bentonite Suspension for Controlling the Common Liver Fluke, *Fasciola Hepatica*, in Cattle in the Gulf Coast Region of Texas. Am. J. Vet. Res., *8*, (1947):353-366.

Acetonemia

Acetonemia sometimes responds to the administration of sodium dehydrocholate. However, the response is not uniform and is not dependable in the opinion of several practitioners who reported their findings at a recent meeting.

• • •

Acetonemia or ketosis has become less of a problem in some herds following the addition to the ration of 10 per cent of animal protein to replace some of the vegetable protein. The precise effect has not been determined, but it seems to prevent the disease, and addition of animal protein to the ration seems to hasten recovery.—*L. W. Cropsey, D.V.M., Illinois.*

• • •

Acetonemia is often complicated with other infections. Of these, endometritis is one of the most common, and no case of acetonemia should be treated without making a careful examination for endometritis and instituting treatment for that condition when it is present as a complicating infection.—*J. T. Schwab, D.V.M., Wisconsin.*

• • •

An analysis of the cases of pyelonephritis occurring in our practice indicates that many of these have followed an attack of ketosis. The question arises whether this infection could have been the result of introducing the catheter into the bladder.—*H. L. Marsh, D.V.M., Wisconsin.*

Penicillin Ointment in Conjunctivitis.—Michigan studies reported in *The Cornell Veterinarian* (Jan., 1950) showed calcium penicillin ointment to be of definite value against conjunctivitis in dogs, especially where streptococci were involved. Application once daily was sufficient, and there were no signs of toxicity or irritation even when the treatment was given for eleven consecutive days.

Swine brucellosis is the cause of loss of 2 pigs per litter in California.—*H. S. Cameron, D.V.M., California.*

An Approach to the Mastitis Problem

M. G. FINCHER, D.V.M.

Ithaca, New York

THOSE WHO represent the dairy industry of New York State have been intensely aware of the importance of mastitis since 1929, when they made it possible through legislative action for Drs. D. H. Udall and S. D. Johnson to initiate a useful mastitis program. At that time, the approach was a combined bacteriologic and clinical study which included careful examination of the milk and the udder. The importance of including the cow and her entire environment became increasingly obvious, and great interest in mastitis control followed their work.

A variety of reasons, including the high price of milk and the high incidence of clinical mastitis, caused the dairymen to induce the 1946 state legislature to make a more generous appropriation for research and educational work on mastitis. Liberal funds became available to the New York State Department of Agriculture and Markets on April 1, 1946, and larger amounts have since been appropriated. Through contract, funds were transferred to Cornell University where Dean W. A. Hagan, representing the New York State College of Veterinary Medicine, designated the medicine department of that college to conduct the program.

It has been the writer's duty to select the personnel,* who have proved to be a coöperative and skillful group.

The program was fairly well under way by Jan. 1, 1947, and a fifth regional laboratory was opened in August, 1948. The sixth laboratory, the so-called central laboratory at Ithaca, was expanded in 1946. A sixth field veterinarian was added to the staff on July 1, 1949, to relieve the others during vacation periods and to put on special drives in given areas.

The staff of the Department of Medicine has coöperated fully with this program, and the clinical trials on new products are confined to cattle that we own or can very closely observe in the Ithaca area.

An accurate statistical report of the activities of the program[1] through Dec. 31, 1947, was developed by Dr. J. M. Murphy, a statistical expert and a noted research worker in the field of mastitis.

Fig. 1—The field veterinarian demonstrating the physical examination and collection of milk samples before a group of interested dairymen and veterinarians at a typical "barn meeting" for demonstrating mastitis control.

The original plan of the program was to do educational and research work on mastitis, employing a small group of experimental cows owned by the veterinary college, but relying principally upon data obtained on larger numbers of cattle in all types of herds throughout the state.

In a short time, pressure from county agents, local veterinarians, and especially from dairymen whose herds were showing undue mastitis prompted us to try to expand the program to include as many herds as possible. We had hoped to work with a few herds intensively, but the impression reached many owners that a visit from us would help them greatly. This has resulted in a rapid expansion and less detailed study than is desirable. Demonstration herds were established in each county and each veterinarian in the area was given an opportunity to become efficient in mastitis diagnosis and treatment. We, thus, have official survey herds where the field veterinarian is in charge of the survey and diagnosis, but the

---

Professor and head of the Department of Medicine and Obstetrics, director of the ambulatory clinic, and in charge of the state-wide mastitis program, New York State Veterinary College, Cornell University.

Presented before the Section on Surgery and Obstetrics, Eighty-Sixth Annual Meeting, American Veterinary Medical Association, Detroit, Mich., July 11-14, 1949.

*H. G. Hodges, supervising veterinarian in charge of extension, publicity and field veterinarians; J. M. Murphy, professor of veterinary medicine and director of laboratories and research; and the following field veterinarians: K. I. Gumaer, Long Island; W. G. Hoag, Canton; H. C. Parker (since August, 1948), Earlville; F. I. Reed, East Aurora; E. W. Tucker, Kingston; and G. M. Ward, (appointed July 1, 1949, rotating field veterinarian). H. W. Bly, Canton, resigned in May, 1948. S. D. Johnson, field veterinarian, (nearly full time on work of mastitis state program); H. P. Studdert, resigned October, 1948; and E. L. Fountain, medical interne (part-time effort on mastitis). The material presented here is the result of the untiring and coöperative effort of this group.

Fig. 2—An apron of concrete is important to prevent udder and feet being dirty.

coöperating local or other veterinarian does the treatment. The other type of herd is one where the local veterinarian collects the samples, advises the owner, and treats the cases. These are called unofficial survey herds. In each instance, the services of the field veterinarian and of the laboratory are free, the fees covering treatment and time of the local veterinarian being assumed by the farmer.

OBJECTIVES OF PROGRAM

Several definite and many indefinite aims were discussed at the beginning of the program. The more important are:

1) Determine how much infection existed in the udders of the dairy herds of the state. Streptococcic infection was present in 37.9 per cent of the first groups of cows studied and an additional 17 per cent had other infections, largely hemolytic staphylococcic infection.

2) Determine the amount of mastitis that existed as judged by definite changes in the milk and udder, detectable by clinical examination. An average of 15.3 per cent of the cows showed some degree of abnormal secretion. Enough more to make a total of nearly 31 per cent showed slight mastitis.

3) An objective, made possible later in the program by the use of a shorter method to determine

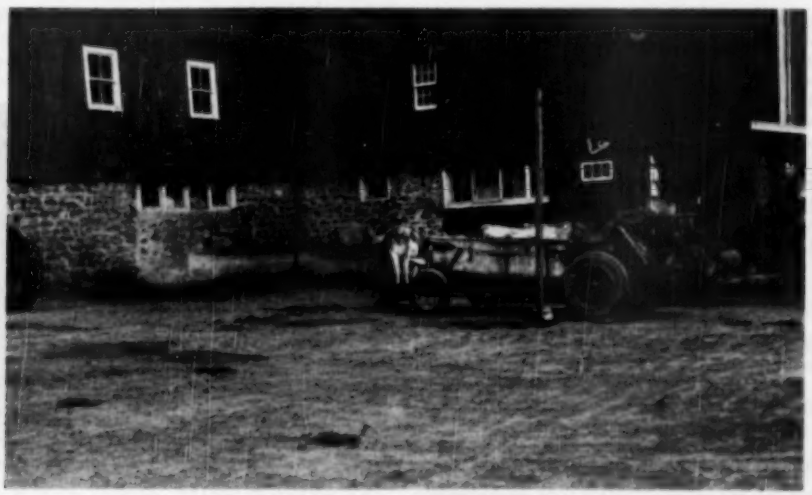


Fig. 3—An ideal concrete barnyard.

the presence of *Streptococcus agalactiae* in udder secretions, was to develop as many herds entirely free of this infection as possible. The aim was to determine what happened to the incidence of mastitis and infections other than *Str. agalactiae* in these herds. The results of this study are not complete, but about 200 herds have very little or none of this type of streptococcic infection. Some of them perform exceptionally well and some rather badly.

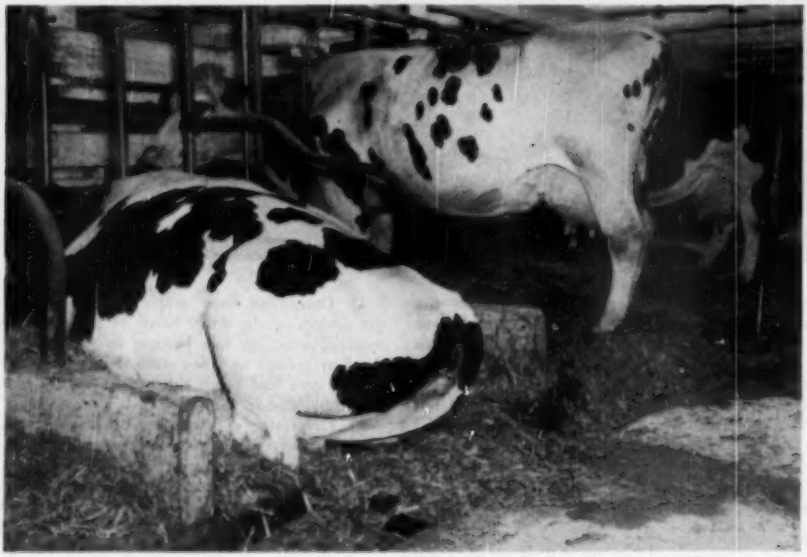


Fig. 4—Curbs between stanchioned cows in wide stalls of correct length hold bedding and prevent teat injuries.

4) One of the most urgent needs seemed to be to learn what relation environmental factors and management practices had to mastitis control in average herds. Results of these observations are given in some detail (Fincher[1]) and in this paper.

5) It was important to alert the veterinary profession as well as the dairymen to the economic importance of mastitis and to teach each group how they could coöperate to control the problem. Dr. H. G. Hodges and his field staff have worked effectively with both groups and, in addition, have had fine coöperation from county agents.

6) An attempt to find the best treatments for each type of infection and each form of mastitis, and then to interest practitioners in better techniques in handling the disease as a herd problem, was given a high rating in importance.

ETIOLOGY OF MASTITIS

Actual experience with acute and chronic mastitis soon leads practitioners and dairymen to suspect that much remains to be learned about the causes of mastitis, and on this point we on the program are agreed. In general, two causes are recognized, the bacterial and the environmental. Most workers have preferred to ignore the environmental causes or, after carefully con-

Fig. 5—Even greater comfort and protection to the udder is provided by a properly managed pen-type stable (lounging pen with loose stabling).

trolled study of the subject,[2] have decided that evidence is lacking to show that any environmental causes, now fully understood, affect the course of the more common udder infections and resulting mastitis. Murphy suspected the bad effect of pasture during two seasons. In Udall's[3] description of the disease, due space is given to all etiologic factors including many phases of environment. Later,[4] he referred to the importance of teat erosions. A popular bulletin[5] from Australia stressed the value of good management as follows: "A sudden outbreak of clinical mastitis in a herd may be due to a breakdown in the general hygiene or cleanliness in the shed, a defect in the valve in the milking machine, or to an outbreak of sores on the teats. These outbreaks may be due to *Str. agalactiae*, but they are commonly due to other types of streptococci, and at times to coliform bacilli. If they (sudden outbreaks) occur, the cause of the breakdown should be sought immediately and corrected." This bulletin also stressed mastitis due to staphylococci and, in control of all mastitis, it emphasized management practices. These include cleanliness in the milking shed with good milking methods. Special emphasis was placed on early detection by the use of the strip cup at each milking.

The importance of age in streptococcic infection was thoroughly studied by Murphy[6] in two herds and his age-factor theory has resulted in additional research on the theoretical and practical causes of mastitis. Spencer and Kraft[7] tried to evaluate age in streptococcic infection in 12 herds in Wisconsin and gave an interpretation of their results as follows: "In 12 dairy herds, the incidence of streptococcic udder infection increased regularly with advancing age, but at different rates in the various herds. The rate of increase of infected animals was correlated with herd management procedures which affected the degree of exposure." These findings led them to emphasize sanitation, segregation, and selection of young, healthy heifers to replace old, infected cows.

(*To be continued*)

The hard pad disease virus is possibly a distemper virus of qualitatively modified virulence.—*Prof. P. Goret, National Veterinary School, Lyon, France.*

Antihistaminics

The evaluation of the various samples of antihistaminic drugs in use severely taxes the mind, and loose talk about their dynamics in veterinary medicine seems premature. Histamine in chemistry and physiology is pretty complex to tackle with antidotes on a scientific basis. In the animal clinic, their use is like shooting at imaginary targets in the dark. As Sternberg, Perry, and LaVan (*J. Am. M. A.*, April 1, 1950) pointed out, there are too many antihistaminics and too little information about their rightful indications, or even their mode of action, other than the vasoconstriction which other drugs also possess. Histamine toxicosis is new in animal pathology. It was not until 1942-1944, when Dr. B. N. Halpen of Lyon, France, working on safer antihistaminics, announced the curing of founder in horses with neoantergan (pyrisamine maleate), that the word came into our literature. The histaminemia and vasodilatation of that malady which the investigation revealed make up the background of the treatment. If there is any other definite indication for antihistaminics in animal patients, it remains to be circumscribed as a recognizable clinical entity, granted the apparently successful use of antihistaminics in certain dermatoses in dogs.

New Equine Narcotic

A new equine narcotic, rapidorm, is a 25 per cent solution of amyl-allyl-N-methyl barbituric acid. When injected intravenously at the rate of 4 cc. per horse, it produces deep general anesthesia. However, the new anesthetic possesses the decided disadvantage of a period of excitation which precedes general narcosis and is marked. Toxic effects were not noted.—*Tierärztl. Umschau (Feb., 1949).*

"Query" Not "Queensland."—The *Q* in the rickettsial infection called Q fever is taken from *Query*, not from *Queensland* (*J. Am. M. A.*, July 23, 1949) as we have been told to believe. The fact that the specific disease was first recognized *per se* in Queensland is but a coincident. *Q* in the sense of *x*, the unknown quantity, explains the derivation.

Theileria Mutans Associated with Bovine Anaplasmosis in the United States

EARL J. SPLITTER, D.V.M.

Manhattan, Kansas

DURING recent experimental studies on bovine anaplasmosis, a piroplasma-like organism was observed in the erythrocytes of a splenectomized calf. The parasite was first detected twelve days after the animal had been injected with citrated blood from a known carrier of anaplasmosis. Continued, daily observation disclosed increasing numbers of the parasite, and a continued absence of Anaplasma. It was finally determined that transmission of Anaplasma had not been effected, presumably because of autosterilization of the carrier. An uncomplicated strain of the piroplasma-like organism was thus established for study.

This hemotropic parasite has been identified by Dr. W. O. Neitz, director of veterinary services, Onderstepoort, Union of South Africa, as *Theileria mutans*, a parasite previously unreported in the United States.

Experimental transmission of the parasite to susceptible animals has been readily accomplished by the intravenous injection of citrated carrier blood. An incubation period varying from twelve to twenty-eight days has been observed. In several splenectomized calves, the parasite has produced a mild fever, anemia, and anorexia. These symptoms have been of short duration, and prompt recovery has occurred. A maximum erythrocytic infection of 5.8 per cent has been noted. In these splenectomized animals, Theileria have persisted in the blood for long periods following their initial appearance. Parasites have now been demonstrated consistently in 1 calf over a period of eight months.

Experimental inoculation of unoperated cattle, either calves or adults, has produced a parasitic infection of low intensity, the frequency being about one parasitic structure to 5 or 10 microscopic fields. No evidence of pathogenicity has been observed in unoperated cattle. Persistent efforts have not as yet been made to demonstrate Koch plasma bodies in gland smears.

The parasite is believed to have originated from naturally infected field cases of anaplasmosis. The carrier from which *Th. mutans* was recovered had been experimentally infected with anaplasmosis in 1943. Pooled blood had been obtained from animals in four separate herd outbreaks in southeast Kansas, and injected into this animal. After recovery, it was held as a reserve carrier for use in producing experimental anaplasmosis. A reëxamination of blood slides made from cattle which were subinoculated from this carrier has disclosed the presence of Theileria. The organisms had apparently been overlooked previously because of their infrequent numbers.

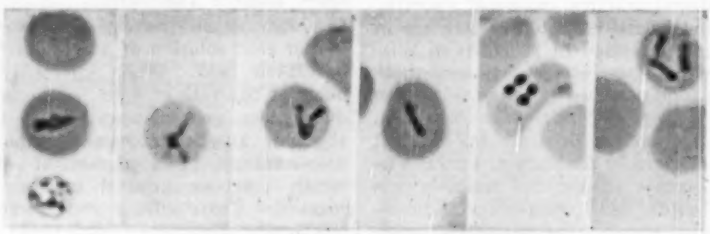


Fig. 1—Some erythrocytic forms of Theileria mutans.

Contribution No. 113, Department of Veterinary Medicine, Kansas Agricultural Experiment Station, Manhattan.

DISCUSSION

Theileria mutans is generally regarded as a nonpathogenic parasite; however, the presence of this organism in the United States should be of interest to veterinarians in this country. Blood forms of *Th. mutans* can not be distinguished from those of *Theileria parva*, the causative organism of east coast fever.[1] Differentiation can be made, however, on the basis of pathogenicity, *Th. parva* being highly pathogenic. *Theileria mutans* may, in infrequent cases, assume pathogenic proportions. Clinical manifestations and death of cattle infected with this parasite have been reported in enzoötic areas. Such cases have usually been found associated with other debilitating or infectious agents.

Cooper[2] has reported that *Th. mutans* may, under certain conditions, produce symptoms and lesions indistinguishable from east coast fever. Neitz[3] suggests that the parasite may become virulent when it is associated with a virus. De Kock and coworkers[1] found, after extensive field observations and experiments, that losses from acute infections of *Th. mutans* are most severe following changes of environment. Single deaths occurring in herds in South Africa have also been attributed to this parasite. In the past, these cases contributed some confusion in the program of control of east coast fever. These deaths from *Th. mutans* have been observed most frequently on farms in which such diseases as coccidiosis, chronic scours, paratyphoid, malnutrition, or verminosis are present.

At the present, nothing is known concerning the distribution of *Th. mutans* in the United States, or whether the parasite occurs independently of anaplasmosis under natural conditions. The relatively few clinical cases that appear in countries where nearly 100 per cent of all native cattle become infected with the organism[4] indicates that clinical cases are undoubtedly rare, if at all present, in the United States where certainly a much smaller proportion of cattle are infected.

Neitz[5] has noted what is probably the most significant factor relative to the presence of *Th. mutans* in this country. The occurrence of this parasite in native cattle indicates that one or more species of ticks (Ixodidae) are present which are capable of transmitting the organism. It can be expected that these vectors may also transmit *Theileria annulata*, should this infection be accidentally introduced by the importation of carriers. Cattle which recover from infections of *Th. parva* or *Theileria dispar* do not continue to harbor the organisms, while those that recover from infection with *Th. annulata* remain permanent carriers and a constant source of infection, providing the necessary tick vectors are present.[6] The introduction of such latent carriers into the United States would probably result in the spread of this pathogenic Theileria.

Neitz[5] suggests that cattle should not be imported into this country from North Africa, the Balkan states, Asia, and other areas in which *Th. annulata* is known to be enzoötic.

References

[1]De Kock, G., Van Heerden, C. J., Du Toit, R., and Neitz, W. O.: Bovine Theileriasis in South Africa with Special Reference to *Theileria Mutans*. Onderstepoort J. Vet. Sci., *8*, (1937):9-125.

[2]Cooper, H.: Tick-Borne Diseases with Some Remarks on Diseases of Cattle Caused by Protozoa. Agric. J. of India., *21*, (1926):95-100.

[3]Neitz, W. O.: Title unknown. J. South Africa Vet. Med. Assoc., *4*, (1933):39-46.

[4]Du Toit, P. J.: Immunity in East Coast Fever. 17th Rep. Direct. Vet. Serv. and Anim. Husb., Union of S. Africa, (1931):3-25.

[5]Neitz, W. O.: Personal communication.

[6]Hutyra, F., Marek, J., and Manninger, R.: Diseases of Domestic Animals. 5th ed. Vol. 1, (1946): 852-858.

Personal Towels for Cows

A paper towel which is highly absorbent, yet strong and rugged when wet, is described as something new in "Cow Towels" by H. G. Hodges, D.V.M., in *American Agriculturist* (March 4, 1950).

These towels are an adjunct to a mastitis-control program because they encourage herdsmen and dairymen to use individual towels on each cow in the herd at each milking. When combined with proper rinsing of milking machine teat cups between cows, this is a means of reducing the carry-over of infection from one cow to the next.

Thorough cleaning and formaldehyde fumigation were credited with eradicating the virus of avian pneumoencephalitis (Newcastle disease) in an Illinois hatchery following a severe outbreak.—*Cornell Vet., Jan., 1950.*

Methods of Internal Parasite Control in Sheep and Lambs

J. P. WILLMAN, B.S., M.S., Ph.D., D. W. BAKER, D.V.M., Ph.D.,
and L. B. EMBRY, B.S., M.S.

Ithaca, New York

IN THE northeastern part of the United States, it is seldom practicable to depend upon pasture rotation alone to control internal parasites of sheep, because flock owners must use permanent pastures at least part of the grazing season. Few flocks are given temporary forage crops or after feed in the meadows. Many flock owners do not give medicinal treatments until the sheep exhibit symptoms of being highly parasitized. They may be interested in using more simple, inexpensive, and effective methods for the control of internal parasites than were commonly recommended when these studies were begun.

The value of the combined copper sulfate and nicotine sulfate solution and of a suspension of phenothiazine given as a drench has been demonstrated by numerous workers in various parts of the country. The value of a mixture of phenothiazine and salt also has been proved. When the work reported here was begun, it seemed highly desirable to test the value of these treatments under the climatic conditions found in New York.

FLOCKS AND PASTURES

White-faced Western ewes with lambs sired by purebred Shropshire, Hampshire, Dorset, and Corriedale rams were used in these experiments. They were grazed as a flock from May 15, or slightly later, to August or September on permanent pasture. The 30-acre hill pasture was divided so that it was possible to alternate the grazing between two areas. Phosphate and ground limestone had been applied but the pasture was of inferior quality and was typical of many hill pastures in this state.

Flocks of 57 to 65 ewes and 42 to 78 lambs, with an average of 61 ewes and 60 lambs were used during the five years in which these trials were conducted. A few dry ewes were included in the tests. The ewe flocks were used in other experiments during the winter feeding period, but differences due to handling during the winter were taken into account each year in dividing the flock for the parasite control studies.

All ewes were drenched with phenothiazine in December or early January and again in May before turning to pasture. The flocks were kept in drylots or in small paddocks near the barn for two or three weeks in May before they were turned on the hill pasture. This procedure was followed in order to complete other experiments conducted with this flock during the winter and spring months.

TREATMENTS FOR PARASITE CONTROL

1) All ewes and lambs were given access, throughout the grazing season, to a mixture of 9 lb. of rock salt (CC grade) and 1 lb. of phenothiazine (wettable powder).

2) One-third of the ewes and lambs were drenched at monthly intervals during the grazing season with a combined copper sulfate and nicotine sulfate solution (1 % of each).

3) One-third of the ewes and lambs were drenched at monthly intervals during the grazing season with a suspension of phenothiazine and water.

The dose of combined sulfate solution and of the phenothiazine suspension varied according to the size of the ewes and lambs. In most cases, the ewes were given doses of 4 oz. of the combined sulfate solution; the lambs were drenched at the rate of 1 oz. per 30 to 35 lb. live weight. The suspension of phenothiazine contained 10 Gm. of phenothiazine per fluid ounce. This suspension was administered to ewes at the rate of about 4 oz. per head and to lambs at the rate of 1 oz. to 35 to 40 lb. live weight.

The flocks treated with the combined sulfate solution were kept off feed and water for ten to eighteen hours before, and for

From the New York State College of Agriculture at Cornell University, Ithaca.

Authors' acknowledgement—Mr. G. L. Hunt, shepherd, Cornell University, has cared for these flocks and has kept most of the records.

two to five hours after, treatment. The flocks treated with phenothiazine were not fasted before or after treatment was administered.

MANAGEMENT OF THE FLOCKS

After weaning time, the ewes were returned to the permanent hill pasture and the lambs were grazed as one flock on improved sheep pastures located near the main barns. When pasture was not available, the lambs were fed in drylot. Grain was fed to the lambs during the postweaning period. The medicinal treatments given above were continued while the lambs were on pasture. The lambs were drenched either a few days before or after they were placed in drylot to be finished for the market. The medicinal treatments that were used during the summer were given to the ewes while on pasture after weaning time. The combined sulfate solution was given to all ewes soon after they were brought into winter quarters, usually in late October or in November.

DISCUSSION AND RESULTS

The best measures of the effectiveness of a system of parasite control or of flock practices are the weights of the lambs when weaned and at marketing time. Lambs that gain rapidly and reach market finish or weight at weaning time, are most profitable. Failure of lambs to make satisfactory rates of gain is due, in many cases, to heavy infections of internal parasites.

It was not possible to keep records of feed consumed, but the gains in weight made by the lambs on pasture and in drylot were recorded. Corresponding gains or losses of the ewes were kept for these periods.

Examinations were made of fecal samples taken from the ewes before they were turned to pasture and from both the ewes and lambs at weaning time. The fecal examinations showed low worm egg counts and the differences between the treated groups were too small to be considered significant.

The alimentary tracts and the lungs from the lambs were saved and were examined for the presence of internal parasites. These examinations of the lambs showed low worm burdens and there were no marked differences that could be attributed to the treatments. Very few infections of the large lungworm (*Dictyocaulus filaria*) were found, but a large proportion of all lambs were infected with the small lungworm (*Muellerius capillaris*).

The gains or losses in weight from the experiments conducted from 1944 through 1948 are shown in table 1. The data shown are the averages for the five experiments. There was considerable variation between years in the gains made by the ewes and lambs; however, there were no significant differences in favor of any of the treatments.

THE EWES

The averages for the five experiments show that the ewes lost some weight from the time they were put on pasture, from the middle of May up to weaning time.

TABLE 1—Internal Parasite Experiments 1944-1948

Treatment in summer	I No drench	II Combined sulfate drench	III Phenothiazine drench
Ewes			
No. of ewes*	103	102	99
Ave. initial wt. in May (lb.)	118.2	119.1	118.0
No. of ewes at weaning**	101	99	97
Ave. loss in wt. to weaning time (lb.)	-1.6	-2.0	-1.7
No. of ewes at close of pasture season	91	91	83
Ave. gain from weaning to close of pasture season	13.9	15.1	14.7
No. of ewes shorn**	88	89	81
Ave. fleece wt. (lb.)	9.3	8.9	9.5
Lambs			
No. of lambs*	100	102	100
Ave. initial wt. in May (lb.)	35.0	34.4	35.0
No. of lambs weaned**	100	99	100
Ave. daily gain to weaning time (lb.)	0.27	0.266	0.278
No. of lambs slaughtered**	88	91	91
Ave. slaughter wt. (lb.)	84.5	85.4	84.4
Ave. daily gain from weaning to slaughter (lb.)	0.19	0.201	0.19

* Number at beginning of parasite trial.
** Reduction in numbers resulted from culling ewes and death of ewes and lambs.

The average loss during this period was 1.6 lb. for the ewes not drenched (lot I) as compared to 2.0 and 1.7 lb., respectively, for the ewes drenched with the combined sulfate solution (lot II) and those drenched with phenothiazine (lot III). On the other hand, these ewes made average gains of 13.9, 15.1, and 14.7 lb. in lots I, II, and III, respectively, from weaning time until the close of the experiment in November or December. It was not possible to keep these ewes separated according to previous treatments during the winter, so it is not known whether these treatments had any marked effect upon the amount of feed required to reach a satisfactory condition before lambing time. There were no appreciable differences in the average gains made by the ewes during the winter. The average fleece weights and the appearance of the ewes were about the same.

It was not possible to study the effect of the treatments over a period of years because only a few received the same treatment for more than two years.

THE LAMBS

The average daily gain of the lambs (table 1) from late May until weaning time shows no significant differences that may be attributed to the parasite-control treatments. The lambs that were not drenched made an average daily gain of 0.27 lb., as compared to 0.266 lb. for those drenched with the combined sulfate solution and 0.278 lb. for those given the drench of phenothiazine.

The lambs were placed in drylot immediately after weaning in 1944, 1947, and 1948, but in 1945 and 1946, they were fed on pasture for sixty-two and fifty-six days, respectively, before being put in the barn. In all experiments, the lambs were selected for slaughter when they reached satisfactory weight and finish. The average daily gain for all trials for the lambs that were not drenched (lot I) was 0.19 lb.; those given combined sulfate, 0.201 lb. (lot II); and those given phenothiazine, 0.19 lb. (lot III).

In only one year, 1948, were the lambs separated into lots according to treatment after they were brought into the barn to be fattened. Records of gain and feed eaten were kept for these lots for eighty-two days. There were 17, 16, and 18 lambs, respectively, in lots I, II, and III. There was little difference in the rate and economy of gains between lots II and III, but the lambs in lot I, given no drench, made smaller gains. The variation in gain was no greater than was obtained from lambs in previous years when they were not sorted according to treatment. The feeding of traces of cobalt and copper to half of the lambs on each treatment in 1948 did not improve the average rate of gain.

RECOMMENDATIONS

The results of these studies over a five-year period indicate that under some conditions the worm burden in farm flocks may be satisfactorily controlled without regular drenching during the grazing season. It is necessary, however, to drench the ewes and lambs with a therapeutic dose of phenothiazine in the spring before going to pasture and again after they come into winter quarters. A mixture of phenothiazine and salt, but no other salt, should be kept before the flock during the grazing season and alternate grazing should be practiced when the flocks are run on permanent pasture.

It is recommended that the entire flock be drenched with the combined copper sulfate and nicotine sulfate solution when small permanent pastures are used and when feed and other conditions are less favorable than they were in these tests. The flock should be drenched as often as once a month during the grazing season with the combined sulfate treatment if it shows symptoms of being wormy. This solution is inexpensive and easy to administer and its use in summer may prove to be good insurance against losses from internal parasites.

Any deaths should be promptly investigated by a postmortem examination to determine the cause and to learn the degree of parasitic infection.

Experience has shown that the use of large pasture areas, grazing sheep and cattle together, moving the flock from one pasture to another, draining wet areas, fertilizing and mowing the pastures, and the use of temporary forage crops reduce losses from internal parasites. The above practices coupled with medicinal treatment are essential for efficient lamb and wool production.

See page 163 for important information on hotel reservations in Miami Beach.

Treatment of Infectious Sinusitis of Turkeys with Aureomycin

J. E. PRIER, D.V.M., M.S.

Urbana, Illinois

RECENT reports indicate that the etiologic agent of infectious sinusitis of turkeys is either a virus or a rickettsiae.[1-4, 6-10] In previous attempts at treatment, argyrol or silver nitrate injected directly into affected sinuses and surgical drainage of the sinuses have been used extensively. These were effective in relieving the upper respiratory symptoms, but had no effect on lung and air sac infections that are frequently associated with the disease. Hitchner[5] reported that streptomycin inhibited the agent of infectious sinusitis in infected chicken embryos and turkeys. He found that streptomycin injected into infected sinuses caused recession of the swelling in seven to ten days. Birds affected with lower respiratory symptoms were apparently cured by injection of streptomycin into the dewlap.

Aureomycin has been reported to have a marked inhibitory effect on rickettsiae.[11] No report could be found concerning its effect on the agent of infectious sinusitis. The present paper concerns aureomycin* treatment of naturally occurring and experimentally induced cases of infectious sinusitis.

TABLE I—Effect of Aureomycin or Streptomycin in Field Cases of Infectious Sinusitis in Turkeys

Condition before treatment	Treatment	Birds (No.) dead/treated*	Autopsy findings in survivors†		
			sinus swelling	air sac involvement	no lesions
BS, LR	Aureomycin—50 mg. in each sinus. One dose.	2/6	2/4	2/4	1/4
BS, LR	Aureomycin—100 mg. intramuscularly. One dose.	0/6	4/6	3/6	1/6
BS, LR	None.	3/7	4/4	3/4	0/4
BS	Aureomycin—50 mg. in each sinus. One dose.	0/2	0/2	2/2	0/2
US	None.	0/2	2/2	2/2	0/2
US, LR	Streptomycin—100 mg. in affected sinus. One dose.	0/4	3/4	2/4	0/4
US, LR	Aureomycin—50 mg. in affected sinus. One dose.	0/5	1/5	3/5	2/5
US, LR	None.	1/2	1/1	1/1	0/1
LR	Aureomycin—100 mg. intramuscularly. One dose.	3/4	1/1	1/1	0/1
LR	None.	3/3	.....	.....	.....
BS	100 mg. aureomycin intramuscularly. One dose daily for 4 days.	2/7**	5/5	2/5	0/5
BS	None.	4/7	3/3	2/3	0/3

*Death occurred one to twenty days after treatment. Unless otherwise indicated, death was apparently due to lower respiratory infection.

**One bird—accidental death.

†Surviving birds were killed from seven to forty-six days after treatment.

BS = Bilateral sinusitis. US = Unilateral sinusitis. LR = Lower respiratory tract involvement.

*Aureomycin supplied by Lederle Laboratories Division, American Cyanamid Company, Pearl River, N. Y.

From the College of Veterinary Medicine and Agricultural Experiment Station, University of Illinois, Urbana.

The technical assistance of Mr. Gerald Dart is acknowledged.

MATERIALS AND METHODS

Field Cases.—Turkeys with swollen sinuses, lower respiratory symptoms (gasping, râles), or both were obtained from several Illinois flocks. It was not possible to tell how long the infection had been present in the individual birds. In most cases, considerable loss of flesh or retardation of growth were present. An attempt was made to use birds that showed similar symptoms in each group. Untreated controls were kept for each treated group.

Aureomycin was injected either into the sinuses (50 mg.) or intramuscularly (100 mg.). One dose was used in most cases. One group of birds was treated intramuscularly for four days with single daily doses of 100 mg.

The birds were killed from seven to forty-six days after treatment, usually by injecting 10 ml. of air into the wing vein. The lesions of treated and untreated turkeys were compared to determine the efficiency of therapy.

Experimentally Infected Birds.—In all cases, infection was induced by the injection of 1 ml. of undiluted sinus exudate from affected turkeys into the left infraorbital sinus. Exudates from two separate outbreaks were used. Treatment was started when one or more birds in the group showed either sinus swelling or coughing and râles. Single doses of 50 mg. of aureomycin were used for intrasinusoidal treatment and 100 mg. for intramuscular. An equal number of untreated controls was retained. Birds were killed seventeen, twenty, and thirty-three days after treatment, and examined for lesions as described above.

RESULTS

A preliminary experiment was conducted to determine the effect of mixing the antibiotic agent with sinus exudate before inoculation into susceptible turkeys. Exudate from a natural case of infectious sinusitis was divided into three parts. One part was treated with 100 mg. of aureomycin per 1 ml., one part with 100 mg. of streptomycin per 1 ml., and one part was not treated. All three tubes were incubated at room temperature for thirty minutes. Three turkeys were then inoculated into the left infraorbital sinus with each sample.

Two of the 3 birds inoculated with untreated exudate had a severe unilateral sinusitis seven days later. No respiratory symptoms were observed in the birds inoculated with the treated exudates during the subsequent three weeks.

Treatment of Field Cases.—The results are summarized in table 1. Thirteen birds were treated by inoculating 50 mg. of aureomycin directly into the infraorbital sinus. Ten birds were treated with 100 mg. of aureomycin intramuscularly. Seven birds received single daily intramuscular injections of 100 mg. of aureomycin for four days.

Intrasinusoidal injections of aureomycin were apparently of some benefit in reducing the sinus swelling. Eight of 13 treated birds showed a reduction of the sinus lesion. None of the control birds recovered from the sinus involvement. The lower respiratory involvement, however, was apparently not affected by the treatment. Thickened air sac membranes, pus over the membranes, and pneumonia were constant lesions in both treated and untreated birds. Only 3 of the treated birds had no lesions at autopsy. There was no indication of the localization of lesions described by Hitchner[3] that could be attributed to aureomycin therapy.

TABLE 2—Effect of Aureomycin in Experimental Cases of Infectious Sinusitis of Turkeys

Strain of virus	Treatment	Days after infection treatment started	Birds (No.) dead/treated*	Autopsy findings in surviving birds		
				sinus swelling	air sac involvement	no lesions
Ill. K	50 mg. in each sinus.	3	0/1	0/1	0/1	1/1
Ill. K	No treatment.	....	0/1	1/1	0/1	0/1
Ill. K	100 mg. intramuscularly.	17	0/5	3/5	4/5	0/5
Ill. K	No treatment.	....	1/5**	2/4	2/4	0/4
Ill. cim.	100 mg. intramuscularly.	8	3/6	3/3	3/3	0/3
Ill. cim.	No treatment.	....	3/6	3/3	3/3	0/3

*Unless otherwise indicated, birds apparently died of lower respiratory involvement.
**Accidental death.

Intramuscular injection of aureomycin had no apparent effect on the sinus involvement. Only 1 bird of 17 treated in this manner was free of lesions at autopsy. Repeated doses of aureomycin were not effective in eliminating lesions of the upper or lower respiratory system. In birds with severe lower respiratory symptoms, there was no decrease in mortality, and the course of the disease was not altered by aureomycin therapy.

Four birds were treated by intrasinusoidal injection of 100 mg. of streptomycin. Only 1 recovered completely from sinus involvement, and none of the treated birds was free of lesions at autopsy.

Treatment of Experimental Cases.—The results are summarized in table 2. Eleven birds were treated by intramuscular inoculation of 100 mg. of aureomycin. No gross lesions were seen at autopsy in 1 bird treated by intrasinusoidal inoculation of 50 mg. of aureomycin. None of the birds treated intramuscularly recovered or improved in condition.

DISCUSSION

Aureomycin apparently had some effect on the agent of infectious sinusitis. When injected directly into the sinus, the upper respiratory symptoms were alleviated, but the lower respiratory tract manifestations of the disease did not seem to be affected. Hitchner[6] reported that the air sac lesions became localized after streptomycin therapy, but in the present study it was observed that these lesions became localized in untreated birds with severe lower respiratory symptoms. In view of this, it appears that the only criterion for determining the efficiency of treatment is the absence of gross lesions as compared with untreated controls.

SUMMARY

1) Aureomycin and streptomycin inhibited the agent of infectious sinusitis when sinus exudate was incubated with each antibiotic agent before inoculation into susceptible turkeys.

2) Injection of 50 mg. of aureomycin into the sinuses eliminated the sinus swelling in 8 of 13 naturally infected birds.

3) Intramuscular injection of 100 mg. of aureomycin did not alter the symptoms or lesions in 17 naturally infected birds.

4) Intramuscular injection of 100 mg. of aureomycin into 11 experimentally infected birds failed to alleviate the symptoms or cure the disease.

References

[1]Bryan, H. S., Prier, J. E., and Grace, O. D.: Infectious Sinusitis of Turkeys in Illinois. Vet. Med., *44*, (1949):31-33.

[2]Groupe, V., Winn, J. D., and Jungherr, Erwin: Isolation of an Agent in Chicken Embryo Causing Infectious Sinusitis of Turkeys. Proc. Soc. Exptl. Biol. and Med., *67*, (1948):397-398.

[3]Groupe, V., and Winn, J. D.: The Characteristics of an Agent Morphologically Resembling the Chlonydozoaceae and Causing Sinusitis in Turkeys. J. Bact., *57*, (1949):515-528.

[4]Hitchner, S. B.: The Pathology of Infectious Sinusitis of Turkeys. Poult. Sci., *28*, (1949):106-118.

[5]Hitchner, S. B.: Streptomycin as a Treatment for Infectious Sinusitis of Turkeys. Poult. Sci., *28*, (1949):627-629.

[6]Jerstad, A. C., and Hamilton, C. M.: The Etiology of Infectious Sinusitis of Turkeys. Poult. Sci., *27*, (1948):802-812.

[7]Jungherr, Erwin: The Pathology of Turkey Sinusitis. 20th Ann. Conf. of Lab. Workers in Pullorum Disease Control, Richmond, Va., June 9, 1948:2.

[8]Minard, E. L., and Jungherr, Erwin: An Apparently New Respiratory Disease of Turkeys. 16th Ann. Conf. of Lab. Workers in Pullorum Disease Control, Storrs, Conn., 1944.

[9]Prier, J. E., Sutherland, A. K., and Beamer, P. D.: Preliminary Studies on a Respiratory Disease of Turkeys. Cornell Vet., *38*, (1948):208-213.

[10]Prier, J. E.: Studies on the Etiological Agent of Infectious Sinusitis of Turkeys. Thesis, 1949, University of Illinois, Urbana.

[11]Wong, Sam C., and Cox, Herald R.: Action of Aureomycin Against Experimental Rickettsial and Viral Infections. Ann. N.Y. Acad. Sci., *51*, (1948):290-305.

Despite the common belief that the cow, and especially the dairy cow, will not stand up if raised in the sling, it is possible to raise cows and to have them remain up. The best procedure is to use a narrow band under the chest, a good breast collar, and a good breeching strap. Some cows raised with this type of harness will stand up.—*F. H. Fox, D.V.M., New York.*

Testing Tuberculin Potency.—A new method of testing the potency of tuberculin by graduated intradermal dosage is described by Umezawa and Suzuki (*Japan. M. J., 1,* [Feb., 1948]: 62-68.) The new method easily and quickly determines the potency of tuberculin and the probable error is smaller than 9 per cent, which is somewhat less than the usual methods of comparison.

Results of Penicillin Treatment During an Outbreak of Erysipelas in Turkeys

P. D. DeLAY, D.V.M., and BERNARD KOCH, D.V.M.

Sacramento, California

Literature Cited

THE NEED for a more effective therapeutic agent for the control of swine erysipelas in turkeys is emphasized by the apparent failure of commercial swine erysipelas antiserum to adequately protect against this infection in turkeys as reported by Rosenwald and Dickinson.[1] Beaudette and Hudson[2] have reported that serums from recovered turkeys seemed to offer more protection against the turkey strain than serums of chickens artificially infected. Lindenmayer and Hamilton[3] reported on the results of serum administered as a preventive to artificially infected turkeys. The serum collected from a bird affected with erysipelas was found to contain erysipelas organisms; hence, was formolized prior to use. These workers expressed the opinion that serums from recovered turkeys might offer more protection than those of swine origin, although the small number of birds used precluded the drawing of definite conclusions. In addition, the evaluation of the merits of the serums was further complicated by the fact that they contained killed *Erysipelothrix rhusiopathiae*.

Grey[4] treated one group of artificially infected turkeys with four doses of penicillin in oil, 20,000 units per dose, at 24-hour intervals, while another group similarly infected were given swine erysipelas antiserum. Of the turkeys treated with penicillin, 90 per cent recovered, but only 50 per cent survival was reported in the serum-treated group.

Grey[5] reported that 0.1 unit of penicillin per cubic centimeter of material completely inhibited growth of *Ery. rhusiopathiae*.

Gifford and Jungherr[6] reported on the efficacy of penicillin following its administration in multiple doses to turkeys naturally affected and of additional recoveries as reported by the owner.

The results of penicillin treatment applied during an outbreak of swine erysipelas in turkeys follow.

From the Animal Pathology Laboratory, State Bureau of Animal Disease Control, Sacramento, Calif.

Flock History

The flock involved in this outbreak was composed of 3,450 Bronze breeders. The ranch upon which the birds were raised has been used for turkey production for several years, although no previous experience with *Ery. rhusiopathiae* had been reported. The ranch is located in foothill country well isolated from other turkey ranches. A few sheep had been maintained on the ranch the previous year. No significant losses had been reported prior to the date when 2 toms were submitted to the laboratory, although clinical evidence of infection was observed by the owner five days previously. The toms were debeaked with an electrically heated instrument four weeks prior to the date when symptoms were first observed and again during the outbreak.

Results

On Jan. 19, 1948, 2 turkey toms, 8 months old, were submitted to the laboratory for examination, and a tentative diagnosis of erysipelas was made on the basis of the microscopic demonstration in heart blood films of organisms which appeared to be *Erysipelothrix rhusiopathiae*.

Subsequently, biochemic and pigeon-inoculation test results confirmed the tentative diagnosis.

Immediately following diagnosis, all affected birds were placed in a hospital pen, temperatures recorded, and treatment initiated. Occasional trips to the ranch were made thereafter. However, because of the distance and prolonged course of the infection, the owner was requested to select affected birds, take temperatures, administer treatment, and record results.

At the outset, 150,000 units of penicillin in wax were injected into the musculature of the thigh. This treatment failed to protect and was supplemented by the ad-

ministration of 50,000 units of crystalline penicillin G potassium. The results are shown in table 1.

TABLE 1—Results of Penicillin Treatment During an Outbreak of Erysipelas in Turkeys

Treatment	Treated (No.)	Recovered (No.)	Recovered (%)	Died (No.)	*Birds given repeated dosage 2nd	*Birds given repeated dosage 3rd
Penicillin wax 150,000 units	48	13	27.08	35	15	0
Penicillin G potassium 50,000 units plus 150,000 units wax	49	40	81.63	9	42	21

*Wax only, 150,000 units.

The marked rise in the survival rate after adoption of the simultaneous treatment is no doubt an indication of the need for immediate protection following the recognition of symptoms.

Most birds selected for treatment were first recognized as dull during early morning inspection, although a search for sick birds was made each evening. In those cases where repeated treatment was administered, the interval between doses was from twenty-four to forty-eight hours. Only 4 of 9 birds whose temperatures had dropped below 105 F. survived. All 9 were treated with penicillin G potassium and penicillin in wax.

TRANSMISSION

At the time of the outbreak, there were four pens of toms, 450 birds, all located on high, well-drained ground. A few of the toms had been moved, prior to the outbreak, from a poorly drained area upon which sheep had been grazed.

The first birds to become affected were in a supply pen of 150 toms and shall be designated as pen "A." These toms were rotated periodically to maintain approximately 50 toms in the hen pens.

Pen B, approximately 30 yards from pen A, held 10 toms, also to be used in the rotation procedure. These toms were younger than those in pen A and were not placed in contact with the hens or other toms until five weeks following the initial recognition of the cases. Despite the proximity of pens A and B, none of the birds in pen B became affected until after they were moved to the hen pens approximately five weeks after the first cases occurred in pen A.

There were two additional pens of birds, one consisting of toms only (pen C) and another of toms and hens (pen D). Both groups had an opportunity for contact through the fence with infected toms in the hen pens, but not with each other. Several toms in pen C became affected; however, those in pen D, which also contained hens, remained free from infection.

The failure of infection to become established in pen B or D, although cared for by the same attendant, indicates that in this outbreak transmission was largely the result of fighting among toms.

SUMMARY

1) Penicillin in wax failed to protect turkeys against natural infection with *Erysipelothrix rhusiopathiae*.

2) Of the birds given a simultaneous treatment of penicillin G potassium, 50,000 units, and penicillin in wax, 150,000 units, 80 per cent recovered.

3) Transmission to susceptible turkeys apparently resulted following exposure to affected birds in the same pen or when the affected and nonaffected birds were separated only by a wire fence. Birds in pens containing toms only became infected, while those in mixed pens, hens and toms, remained free from infection despite a similar opportunity for exposure.

4) Debeaking seemed to be of little value in preventing the spread of infection.

References

[1]Rosenwald, A. S., and Dickinson, E. M.: Swine Erysipelas in Turkeys. Am. J. Vet. Res., *2*, (1941): 202-215.

[2]Beaudette, F. R., and Hudson, C. B.: An Outbreak of Acute Swine Erysipelas Infection in Turkeys. J.A.V.M.A., *88*, (1936):475-488.

[3]Lindenmayer, J. E., and Hamilton, C. M. S.: Treatment of Swine Erysipelas in Turkeys with Serum from Turkey Infected with *Erysipelothrix Rhusiopathiae*. J.A.V.M.A., *100*, (1942):212-213.

[4]Grey, C. G.: Penicillin in Treatment of *Erysipelothrix Rhusiopathiae* Infected Turkeys. Vet. Med., *63*, (1947):177-178.

[5]Grey, Chas. G.: Effects of Penicillin on *Erysipelothrix Rhusiopathiae* and on Mice Infected with that Organism. Vet. Med., *62*, (1947):74-75.

[6]Gifford, Rebecca, and Jungherr, Erwin: A Report on Penicillin Treatment of Swine Erysipelas in Turkeys. Michigan State Veterinarian, 7, Fall, 1946.

Sulfaquinoxaline sometimes serves to keep a disease under cover, only to have it break out later.—*G. J. Cottier, D.V.M., Alabama.*

A Field Test of Immunization Against Newcastle Disease (Pneumoencephalitis)

CARL OLSON, JR., D.V.M., M.S., Ph.D., IDA C. BLORE, B.S., M.S., F. R. WOODRING, D.V.M., and C. B. McGRATH, B.S., D.V.M.

Lincoln, Nebraska

COMMERCIALLY manufactured vaccines containing live Newcastle disease virus (NDV) were released for distribution in July, 1948. The release by the federal control agency was contingent upon the approval of the animal disease-control agencies in their respective states.[1] At this time, there was no established plan for the use of such a product in the control of Newcastle disease (ND) of poultry. Previous experience of Beach[2] had indicated that products containing a killed virus were unsatisfactory for the control of this disease. Van Roekel and collaborators[3] had reported that a live NDV of low virulence would produce an immunity which appeared to be permanent. Brandly, Moses, and Jungherr[4] have demonstrated the passive transference of immunity from hens resistant to ND to their offspring. The transference was by means of immune substances contained in the egg yolk. The duration of the passive immunity in progeny coming from such eggs was approximately two weeks. These facts were seized upon and amplified by many who implied that extensive use of a live virus vaccine would eliminate the problem of ND in chickens. Actual demonstration of such results had not been accomplished at that time. A potential hazard of extensive use of live NDV was dissemination of the infection in areas where it did not already exist.

A plan was developed in June, 1948, to test the value of live virus ND vaccine in anticipation of its release. This plan involved coöperation of the Nebraska Bureau of Animal Industry, certain practicing veterinarians, those hatcheries interested, and the Department of Animal Pathology and Hygiene at the University of Nebraska. Use of vaccine was restricted to the immunization of birds intended to become producers of eggs for commercial hatcheries. Five hatcheries agreed to participate in the plan which required vaccination of all birds in their producing flocks. The results of these trials and the observations made constitute the basis of this report.

METHODS

The live virus ND vaccines used came from two commercial manufacturers. They are distributed through channels which restricted the use of the vaccine to only those flocks belonging to farmers supplying eggs for the coöperating hatcheries. Vaccination was done with the stick method by lay personnel employed by the hatchery. Prior to vaccination, each flock was visited by a veterinarian to ascertain if circumstances were favorable to vaccination. Among the circumstances considered were the health of the flock and whether there might be spread of the infection as a consequence of the vaccination.

Samples of blood were obtained from 8 to 10 individual chickens in each of the flocks before and after vaccination. These samples were pooled for a single test of their ability to inhibit the hemagglutination (HI test) of chicken red blood cells by formalin-killed NDV. The chickens furnishing the samples of blood were selected at random and the same birds were not sampled for both pre- and postvaccination tests. The interval between vaccination and collection of the postvaccination blood samples varied from twenty to more than eighty days. Postvaccination samples were collected two or more times in some flocks. The hemagglutination-inhibition (HI) test was conducted according to a standard method.[5] By this method, a titer of less than 40 was considered negative, 40 was considered suspicious, and a titer of more than 40 was accepted as evidence of previous exposure to NDV.

A record of the physical reaction of the flocks to vaccination was obtained at the time of collection of the postvaccination blood samples.

The effectiveness of the plan for controlling ND in progeny coming from the vaccinated

From the Department of Animal Pathology and Hygiene, University of Nebraska, Lincoln (Olson, Blore, and Woodring); and Nebraska Bureau of Animal Industry, Lincoln (McGrath).

Published with the approval of the director as Paper No. 491, Journal Series, Nebraska Agricultural Experiment Station.

The authors gratefully acknowledge the coöperation of the state veterinarian, Dr. E. P. Anderson and his staff, and the hatcheries and flock owners involved.

flocks could be checked only in a general way. The hatcheries reported their general observations on livability of the chicks. Instances of ND in poultry flocks coming to the attention of the diagnostic laboratory were correlated with the source of the chicks.

RESULTS

Hemagglutination-Inhibition Tests.—The general results of the HI tests were similar with respect to the supply flocks of the five hatcheries and, therefore, will be considered as a group. Altogether, 255 flocks of chickens were involved. Successful tests of the HI reaction were obtained in 232 of the flocks prior to vaccination. Of these, 24 (10.3%) had an HI titer of greater than 40. All flocks were vaccinated regardless of the prevaccination titer. Following vaccination, 163 of the 255 flocks (64%) had a significant titer of greater than 40, while 92 had titers of 40 or less. Samples were taken at a later date from 61 of these 92 flocks for recheck with the result that a significant titer of greater than 40 was found in 45 additional flocks. Considering the recheck tests, 81.6 per cent of the 255 flocks then showed a significant titer of greater than 40.

The data were examined to see if the interval between vaccination and the taking of postvaccination samples was significant in determining the titer of the blood samples. There was no significant association of the titer with interval between vaccination and the time blood was taken for test. For example, in 63 flocks tested thirty to thirty-nine days after vaccination, 63.5 per cent had a significant titer, and in 19 flocks tested sixty to sixty-nine days after vaccination, 63.2 per cent had a significant titer. Similar percentages were found in flocks tested forty to forty-nine and fifty to fifty-nine days after vaccination.

Ten flocks, which had a significant titer of more than 40, were sampled a third time from 124 to 251 days after vaccination. Their titers at this time were definitely less than they were during the interval from thirty-four to sixty days after vaccination.

The data were further examined to see if the postvaccination HI titers of 40 or less were present in the flocks which had high titers of more than 40 prior to vaccination. There was no correlation.

Mortality and Egg Production Following Vaccination.—Information on mortality of the birds following vaccination was obtained at the time the samples of blood were taken for determination of the postvaccination HI titer. Mortality from all causes was considered and calculations on mortality were based on the number of chickens in the flocks. In the youngest age group of birds (2 to 4 months), the mortality was 0.64 per cent of 20,841 chickens; in the group of birds from 4 to 6 months of age, the mortality was 0.4 per cent of 13,838 chickens; and in birds from 6 to 30 months of age, the mortality was 1.2 per cent of 8,918 chickens.

Information on the egg production of birds following vaccination was available in 76 flocks. Thirty-five of these flocks were in the initial stages of egg production, the birds being from 4 to 6 months of age. About half the flocks (51.4%) showed no change in egg production. There was a slight decrease of egg production in 22.9 per cent of the flocks, a moderate decrease in 14.3 per cent, and a marked decrease in 11.4 per cent of the flocks. In the group of birds which were in good egg production (41 flocks of chickens from 6 to 30 months old), there was no change in egg production in 21.8 per cent of the flocks. There was a slight decrease of egg production in 4.9 per cent of the flocks, a moderate decrease in 7.5 per cent, and a marked decrease of egg production in 65.8 per cent of the flocks.

The data were examined to see if there was a correlation of the HI titers prior to vaccination and those found after vaccination with the degree of change in egg production. One might have expected the difference in titers before and after vaccination to be less in the birds with either no change in egg production or only a slight reduction in egg production. Further, those flocks which showed a marked reduction in egg production might have been expected to have a great difference in the HI titers. No such correlation could be established in either of the two sets of circumstances.

Spread of Vaccination Infection to Other Chickens.—Four farms each had two groups of chickens; in each case, one group was intended for the production of hatchery eggs and the other group was not. Only those chickens intended for production of hatching eggs were vaccinated. The owners were advised to take precautions to prevent spread of the disease caused by vaccination. These precautions included phys-

ical separation of the two groups of birds and separate attendants. The nonvaccinated flocks on these four farms remained in a healthy condition and tests of their HI titers on samples obtained at the time post-vaccination samples were obtained from the immunized birds, indicated that no infection had occurred in the nonimmunized chickens.

Observations on ND in Progeny from Immunized Flocks of Chickens.—The five hatcheries whose breeding stock had been vaccinated reported good livability of their chicks and freedom from ND. Two instances of a respiratory disease in chicks coming from one of the hatcheries were specifically investigated and found to be infectious bronchitis.

Another approach to determine the effectiveness of the vaccination program was to examine the history of the flocks in which the diagnostic laboratory had found ND. This proved to be more productive of information. During the spring and summer of 1949, ND was diagnosed in 51 shipments of chicks delivered to farmers in Nebraska, from whom detailed information could be secured. This information was correlated with the immunity status of the supply flocks (table 1).

Newcastle disease occurred in 14 shipments of chickens coming from three of the five hatcheries whose supply flocks had been immunized. In five of the outbreaks, the disease developed more than a week after delivery to the farm. This would be at a time when parental passive immunity would have been neglible or absent. Twelve outbreaks of ND were in shipments of chickens coming from a single hatchery (hatchery A, table 1) whose supply flocks had been immunized. Nine outbreaks occurred within seven days of delivery to farms. In four instances, the chickens were "started stock" and in five instances, they were baby chicks.

During the same period, 17 shipments of chickens, coming from 14 Nebraska hatcheries whose supply flocks were not immunized, developed ND. The disease occurred in 20 shipments of chicks coming from 17 out-of-state hatcheries. The status of immunity of the supply flocks for these hatcheries was not known.

Of the 51 outbreaks, 33 occurred within seven days of arrival on the farm, indicating that exposure to infection occurred either at the hatchery or while the chickens were enroute.

A study of the mortality in the outbreaks did not indicate any marked decrease of mortality in the group of chickens coming from known immunized stock.

In 30 of the outbreaks, information was obtained on spread of the infection to other chickens on the premises. This occurred in 27 of the outbreaks. There was no indication of protection against spread of the disease because of the affected shipments coming from immunized supply flocks.

DISCUSSION

Development of a significant HI titer has been generally regarded as an indication of development of immunity. The results of the tests made on samples taken from the flocks following vaccination were peculiar

TABLE I—Analysis of 51 Lots of Chicks Which Developed Newcastle Disease*

Delivered by	Number of hatcheries	Supply flocks immunized	Shipments developing disease	Sick within 7 days of arrival on farm Age (days) when delivered			Sick 7+ days after arrival on farm	Mortality				Spread to other chickens on premises		
				1 to 7	7 to 14	14+		To 25%	25 to 50%	50 to 75%	75% +	Yes	No	Not known
Nebraska hatcheries	1(A)	Yes	12	5	2	2	3	4	2	3	3	10	2	—
	1(B)	Yes	1	—	—	—	1	—	—	1	—	1	—	—
	1(C)	Yes	1	—	—	—	1	—	—	1	—	—	—	1
	1(D)	Yes	0	—	—	—	—	—	—	—	—	—	—	—
	1(E)	Yes	0	—	—	—	—	—	—	—	—	—	—	—
	14	No	17	2	6	2	7	6	3	2	6	7	—	10
Out-of-state hatcheries	17	not known	20	10	—	4	6	3	3	6	8	9	1	10
TOTAL	36		51	17	8	8	18	13	8	15	17	27	3	21

*The data were compiled on the basis of (1) immunization of supply flocks with live virus Newcastle disease vaccine; (2) time when illness was first noticed relative to arrival on farm and age when delivered; (3) mortality of affected chickens; and (4) spread to other chickens on the farm.

in that approximately the same percentage had a significant titer of more than 40 regardless of the interval between vaccination and test. The bulk of observations were made within seventy days of vaccination. If the postvaccination HI titers have significance with respect to the immunity status of the individuals, then only about 65 per cent of the flocks were rendered immune. The results reported by Beach[6] indicate that some chickens failed to respond to the immediate vaccination and later developed infection as result of contact with other members of the flock undergoing a vaccination infection. Such a circumstance might explain some of the low titers found in this study. The technique of using pooled samples from several individuals from the flock for the actual HI test is subject to some criticism.

In general, the physical reaction of the flock from the illness caused by vaccination was not particularly serious except in those birds which were in egg production. With one exception, none of the five coöperating hatcheries reported any serious illness in the producing flocks that had been vaccinated.

One instance of apparent failure to induce a lasting immunity in a laying flock is worthy of note. In this instance, a farmer had two groups of pullets intended for hatchery egg production. Both groups of pullets had an HI titer of 10 before vaccination. After vaccination, the titers on the two groups were 10 and 1,280, respectively. A recheck of the low negative titer of 10 in this flock was not made. Both flocks were vaccinated in September, 1948. In May, 1949, a group of pullets and cockerels on range on the same farm were vaccinated with live virus ND vaccine. Two weeks later, the adult flock experienced a drop in egg production from about 50 per cent to 10 per cent within ten days. At this time, there were also two groups of younger chicks on the premises. The infection from vaccination was apparently transferred to these chicks. In the baby chicks, there was a loss of from 5 to 8 per cent. Specimens from the baby chicks were examined at the laboratory and a significant high titer of HI antibodies was found. Active ND in the laying flocks which had been vaccinated seven months earlier can only be suspected by circumstantial evidence.

Observations on the livability of chicks from hens vaccinated with live virus vaccine came from data obtained at the diagnostic laboratory. Chicks from four of the five hatcheries whose breeding stock had been immunized were not represented in any of the outbreaks which occurred within seven days after arrival on a farm.

One hatchery must have experienced considerable difficulty with ND infection, for observations indicated that 12 outbreaks of disease occurred in shipments of chickens coming from this hatchery. In three of the outbreaks, the chickens became sick more than seven days after arrival on the farm. In some instances, the outbreak occurred three or four months after delivery to the farm and would certainly represent cases where the infection was brought to the chickens on the farm. In five instances, however, the infection developed in chicks less than 1 week old and within seven days after arrival on the farm. These circumstances would strongly indicate that the infection was coming from the hatchery or that the birds were receiving severe exposure while in transit. Since some of the chicks were delivered by private vehicle or the hatchery's own truck from the hatchery to the farm, the possibility of outside infection is extremely remote. Other evidence served to confirm the suspicions that ND was active in stock being held by this hatchery and sold as started stock.

These results clearly indicate that vaccination of hens supplying hatchery eggs is not the sole answer to the problem of controlling ND infection in baby chicks. The hatchery must not place entire dependence upon such parental immunity to overcome the virulence and infectivity of NDV. Proper sanitary and hygienic measures must be carried out. These would include prompt removal of newly hatched baby chicks from the hatchery to destination without either direct or indirect contact with other baby chicks. If the program of holding and selling started stock is necessary, the operation should be carried out in a building well removed from the hatchery itself and by separate personnel.

SUMMARY

The flocks producing hatching eggs for five Nebraska hatcheries were immunized with live virus Newcastle disease (ND) vaccine. Prior to vaccination, about 10 per

cent of the flocks showed a significant HI titer of greater than 40. Following vaccination, about 65 per cent of the flocks showed a significant HI titer of greater than 40. The level of titer seemed to have no relation with time interval between vaccination and the test, up to seventy days postvaccination.

The reaction following vaccination was more severe in birds in egg production than it was in younger birds. Among flocks that were laying well, there was a marked decrease of egg production in 65 per cent of the vaccinated flocks.

Analysis was made of 51 outbreaks of ND in young chickens during the hatching season following the vaccination program. In the case of one hatchery, whose producing flocks had been vaccinated, many cases of ND occurred within seven days of arrival on a farm in chicks less than 7 days of age. This suggests that the parental immunity can be overcome by infection developed in a hatchery or while enroute to a farm.

Of the 51 cases of ND examined, 33 occurred within seven days of arrival on the farm. These data indicate that infection with ND commonly occurs at the hatchery or during transit to the farms.

References

[1]Skidmore, D. I.: Communication to Chief, Nebraska Bureau of Animal Industry, Lincoln, Neb.

[2]Beach, J. R.: Avian Pneumoencephalitis (Newcastle Disease). Chapter in: Biester, H. E., and Schwarte, L. D.: Diseases of Poultry. Iowa State College Press, 2nd ed., (1948):489-512.

[3]Van Roekel, H., Sperling, F. G., Bullis, K. L., and Olesink, O. M.: Immunization of Chickens Against Newcastle Disease. J.A.V.M.A., *112*, (1948):131-132.

[4]Brandly, C. A., Moses, H. E., and Jungherr, E. L.: Transmission of Antiviral Activity via the Egg and the Role of Congenital Passive Immunity to Newcastle Disease in Chickens. Am. J. Vet. Res., 7, (1946):333-342.

[5]Brandly, C. A., Jones, E. E., Jungherr, E. L., Moses, H. E., and Tyzzer, E. E.: The Hemagglutination and Hemagglutination-Inhibition Tests for the Diagnosis of Newcastle Disease. Rept. U.S.D.A. B.A.I. Path. Div. Oct. 21, 1946.

[6]Beach, J. R.: Results of Controlled Field Trials of Live-Virus Avian Pneumoencephalitis (Newcastle Disease) Vaccine in California. State of California Department of Agriculture Bull. 38, No. 2, (1949): 67-91.

The four "S's" of sanitation are: sweep, scrub, scrape, and spray.—*G. J. Cottier, D.V.M., Alabama.*

Mastitis in a Goat

A 9-year-old Toggenberg female goat was presented at the veterinary hospital, University of Pennsylvania, for treatment of mastitis following home treatment with sulfamethazine by the owner (*Vet. Exten. Quart.*, 112, School of Veterinary Medicine, Philadelphia, Oct. 16, 1948).

The right side of the udder was firm and hard, and the supramammary lymph gland was much enlarged. The affected half of the udder was one-third smaller than the normal side. Temperature was 101.5 F., respiration 16, pulse 64. Milk samples showed no striking changes.

Treatment consisted of infusion into the affected udder of 40,000 units of penicillin in 20 cc. of a commercial water-in-oil vehicle, along with intramuscular injection of 250,000 units of penicillin in oil. This treatment was repeated the following morning.

When the laboratory cultures indicated the infection present to be *Escherichia coli*, the affected udder was infused with 20 cc. of sterile distilled water in which 1/5 Gm. of streptomycin had been dissolved.

In twelve hours the milk samples were negative; in twenty-four hours systemic improvement was noticed; and in forty-eight hours the case was discharged.—*E. L. Stubbs, V.M.D., Pennsylvania.*

Treatment of Hyperkeratosis

Hyperkeratosis, mange, fungus diseases, and other skin conditions in cattle and large animals are reported to be favorably affected by applications of a product called "ichor." The local lesions on infected cattle were sprayed with full strength aqueous solution of the drug, and an ointment was applied immediately over the wet surfaces. This treatment was repeated twice daily for one week by which time favorable results were observable. D. T. Ensign, V.M.D., Hudson, N. Y., reports (*Vet. News*, New York State VMA, Feb.-March, 1950) this use of the new product and calls attention to the fact that there have been some relapses.

Small (10 mg.) doses of stilbestrol daily are highly effective in ridding pregnant cows of granular vaginitis.—*A. H. Quin, D.V.M., Missouri.*

The Practical Use of Diethylstilbestrol in Dairy Cattle Practice

CARL F. SCHLOTTHAUER, D.V.M.

Rochester, Minnesota

THE SYNTHETIC estrogenic substance, diethylstilbestrol, commonly referred to as stilbestrol, is used in the treatment of a wide variety of conditions common to animals. This agent has both an estrogenic and a lactogenic activity in cows and females of certain other species. Some of its uses in cattle were reviewed recently by Glenney[1] and Reece[2]. Because of its estrogenic activity, diethylstilbestrol is used frequently in the treatment of various conditions contributing to or causing sterility in the cow. Its lactogenic activity, too, is recognized generally, but it is not often used clinically for this purpose. In dairy cattle practice, a lactogenic agent frequently can be used effectively. Two such instances will be described in this report.

REPORT OF CASES

Case 1.—A 2-year-old Holstein-Friesian female, when examined about eight months after having been bred, was found not to be pregnant. She was of good stock and the owner wanted to keep her in the herd, but he hesitated to do so because of the cost of maintaining this animal in an unproductive state for another nine months or longer. Since it was demonstrated by Reece[3] that lactation can be induced artificially in heifers by the administration of diethylstilbestrol, it was decided to use this agent and attempt artificially to induce lactation. If this could be accomplished it might make her salvage less costly.

Treatment was begun on April 18, 1945. The heifer on this day received 20 mg. of diethylstilbestrol in oil by intramuscular injection. This treatment was repeated daily until May 5, and then on every second day until May 20, when it was discontinued.

Beginning enlargement of the heifer's udder was noted on about the fifth day following the initial injection of diethylstilbestrol, but lactation did not commence until May 5. The udder on this day appeared somewhat distended and 2.2 lb. of milk was withdrawn from it. Milk production thereafter increased progressively until May 30 when it amounted to 14 lb. daily. The heifer during her entire artificially induced period of lactation produced 1,461.2 lb. of milk, valued at $20.00 above the cost of feed consumed. This was not as great an amount of milk as this heifer seemed capable of producing but since she was re-bred and conceived during this period of lactation her salvage was not too costly.

Case 2.—A 5-year-old Jersey cow, a so-called family cow, had served her purpose well until, at term, she not only failed to exhibit gross evidence of approaching parturition but also was not lactating. Examination of her uterus by digital palpation through the rectum revealed that it contained a mummified fetus. The size and condition of this fetus indicated that it had died during the fourth or fifth month of gestation. Because of its small size, it was felt that the fetus would be expelled spontaneously if estrus developed. Since, in the cow, estrus usually will develop within twenty-four to seventy-two hours after expression of a functioning corpus luteum from an ovary, this means of inducing estrus was considered but the ovary bearing the corpus luteum of pregnancy could not be palpated through the rectum. It, therefore, was decided to induce estrus artificially by the administration of diethylstilbestrol. Since this was a family cow and she had ceased lactating, it seemed desirable also to attempt artificially to initiate lactation. If this could be accomplished, she would continue to serve the purpose of a family cow until she had been re-bred and had passed through another gestation period.

Treatment was begun on March 20. The cow on that date received an initial intramuscular injection of 50 mg. of diethylstilbestrol in oil. Further treatment was withheld until March 25 when 20 mg. of diethylstilbestrol in oil was administered

From the Division of Experimental Medicine, Mayo Foundation, Rochester, Minn.

intramuscularly. Administration of this dose was repeated daily until April 1, and thereafter on every second day until April 10, when it was discontinued. Estrus developed and the mummified fetus was expelled spontaneously March 27, the seventh day after the initial treatment. Lactation commenced on March 30 and by April 10, twenty days after the initial treatment, it had reached its maximum.

The cow produced 12 to 16 lb. of milk daily during the first six months of her artificially induced lactation period. She was re-bred May 29, 1946, conceived, and carried the calf to term. The treatment in this instance, too, enabled the owner to salvage the cow not only for future use as a family cow but also for immediate use for such purpose.

COMMENT

These cases illustrate that lactogenic agents can be used clinically in veterinary medicine. This report also calls attention to the lactogenic activity of diethylstilbestrol. It is a highly effective lactogenic agent when administered in adequate amounts. The daily administration of 20 mg. until lactation commenced and on every second day thereafter until it had reached its maximum, at which time treatment was discontinued, was found to be adequate in both cases. This treatment apparently did not impair the breeding efficiency of the animals because they both were bred and conceived soon after it was discontinued.

References

[1]Glenney, W. C.: Stilbestrol in Dairy Practice. North Am. Vet., *25*, (1944):595-599.

[2]Reece, R. A.: Hormonal Therapy in Relation to Veterinary Practice, J. A. V. M. A., *106*, (1945): 191-200.

[3]Reece, R. A.: Initiation and Maintenance of Lactation in Dairy Heifers by Hormone Administration. Proc. Soc. Exptl. Biol. and Med., *52*, (1943): 145-146.

Sulfamethazine for Caprine Enterotoxemia.—A British report (*Vet. Rec.*, Feb. 18, 1950) advocates the use of sulfamethazine in treating acute and chronic enterotoxemia in goats. A single dose of 1 Gm. per 10 lb. of body weight is given the first day. Next day, this dose is divided into four parts and one part given every four hours. Scouring usually stops within forty-eight hours, but if it does not, the four-hour dosage schedule may be repeated.

Warble Fly Control

Derris powder containing 5 per cent rotenone, or its equivalent, is the insecticide recognized as one of the safest to use on cattle. In Ontario, about 250,000 animals received two treatments for warble control in 1950. Each animal was sprayed with approximately 1 gallon at each treatment, applied at 400 lb. pressure. Community control on a township basis is encouraged. The Ontario warble fly committee submits the following conclusions as presented by A. A. Kingscote, D.V.M., Ontario:

1) Large sums of money are being wasted by improper or inefficient spraying.

2) Power spraying, under the recommended conditions, can produce satisfactory warble grub control.

3) Hand treatment will also give satisfactory control.

For the hand treatment the following mixture is recommended:

Derris or cube containing 5 per cent rotenone, ½ lb.
Neutral soap, 2½ oz.
Water to make 1 gal.

This wash may be applied to the backs of the animals and worked well into the hair with a stiff brush. It is important that the skin be thoroughly wetted.

Preventing White Scours

A new explanation is offered for the fact that calves running with and nursing cows seldom develop white scours, while those which are hand-fed do develop this disease. The explanation comes from Dr. H. J. Geddes, of New South Wales. He postulates that the calf which is nursing also salivates freely and that the saliva forms 10 to 15 per cent of the food swallowed. This, in turn, produces a light, frothy, easily digested curd. On the other hand, the calf which is pail-fed swallows all of its milk within a minute or two and gets very little saliva mixed with it.

To substantiate this belief, Dr. Geddes reports that calves nursing on cows that milk freely and leak milk are more likely to develop white scours than are calves nursing on cows which are hard milkers.—*J. Dept. Agric., South Australia (Jan., 1950).*

Calves can die of coccidiosis without any diarrhea.—*L. R. Davis, D.V.M., Alabama.*

Report 7,597 Rabies Cases in 1949

The U. S. Bureau of Animal Industry says that 7,597 cases of rabies were reported in all species in 1949, as compared with 8,508 for the previous year. Heaviest incidence was in Kentucky, Texas, Indiana, Ohio, New York, and Georgia. No cases were reported from Delaware, Maine, Montana, Nevada, New Hampshire, North Dakota, Oregon, Utah, Vermont, Washington, and Wyoming. A breakdown of the total showed 10 cases in man, 5,237 in dogs, 413 in cats, 639 in cattle, 54 in swine, 24 in horses, 22 in sheep, 6 in goats, and 1,192 miscellaneous cases mostly in wild animals.

Rabies-Control Measures

The incidence of rabies throughout many parts of the country has increased at an alarming rate during the last fifteen years. In recent years, more than 30,000 persons annually have required vaccine inoculations (Pasteur treatment). The annual cost to the country for human vaccine treatments and livestock losses has exceeded $5 million.

It has been unanimously agreed by national authorities that nation-wide uniformity of control procedures will be necessary for the eradication of rabies from the United States.

The basis upon which rabies eradication rests is adequate diagnostic services. To this end, the cumbersome practice of preparing histologic sections is no longer necessary. A film of brain tissue, when properly prepared, is just as accurate for purposes of diagnosis and is manifestly simpler, quicker, and less costly. The film can be made to best advantage by the impression technique, because a large amount of nerve tissue can be concentrated in a small area without damage to neuronal and interstitial cells.

When Negri bodies are not found on impression films, it is necessary to proceed to animal inoculations. For these, white mice are preferred. Intracerebral inoculation of infected brain material produces typical and constant symptoms in five to eleven days with the consistent production of Negri bodies. When this animal inoculation procedure was used on all Negri-negative specimens, 10 to 12 per cent were found positive by mouse inoculation, although they had been missed by direct smear microscopic examination. When badly contaminated material arrives for diagnosis, penicillin treatment of the suspensions is possible. Such treatment stops the action of the bacteria but does not interfere with the activity of the virus. Suspensions treated with penicillin are ready for inoculation within thirty minutes. All older methods of bacterial inactivation required from two to forty-eight hours for preparation.

Annual vaccination of dogs is an essential means for controlling rabies and it should be encouraged to supplement other measures, such as licensing, quarantine, and the elimination of stray animals. It has been demonstrated repeatedly that, despite thorough dog-control activities, the eradication of rabies is much more rapid if these control activities can be coupled with mass immunization.

Canine rabies vaccine has been greatly improved during recent years. Its manufacture has been standardized by federal regulation, and all vaccine now on the market is required by the U.S. Bureau of Animal Industry to pass the stringent Habel mouse-potency test. This test not only standardizes the amount of active virus present, but it also can establish this virus level on a high plane.

Control operations must be conducted at the local level and they are most effective on a county-wide basis or on a multi-county unit basis, depending on the extent of the local health jurisdiction. A local rabies-control program should include three broad measures: (1) impounding and destruction of all stray and ownerless dogs; (2) annual antirabies vaccination of all dogs; and (3) registration or licensing of all dogs. Combining the latter two simplifies the control program.

There is no disease about which the public is more misinformed. It is time to dispel superstitions, prejudices, and misinformation. Some of this deals with wildlife. Because mass immunization tactics cannot be applied to the susceptible wild animals, organized trapping programs which depend on "encirclement" and "thinning out" are

Excerpts from "Rabies Problems and Control, A Nation-Wide Program," by J. H. Steele and E. S. Tierkel in *Public Health Reports* (June 24, 1949): 785-796.

used to control epizoötics of rabies when these occur, which is usually in the presence of over-population of foxes.

Rabies eradication is possible. The nature and extent of the problem is well known. The implements for obtaining eradication are available and the strategy has been planned. Proper integration of local, state, and federal control agencies in a unified national program will achieve this desired end.

Countries Free from Rabies

Countries free from rabies include Norway, Sweden, Denmark, Great Britain, Australia, Hawaii, and Puerto Rico. The disease was present in the Scandinavian countries about 1825 but was eliminated shortly thereafter by the imposition of strict sanitary measures.

First reported in England in 1734, it remained enzoötic until rigid dog-control measures and quarantine eradicated the disease in 1903. Since that time, there have been some minor outbreaks but rabies has been effectively controlled and whenever isolated cases have appeared they have been promptly stamped out.

Hawaii does not have and never has had rabies. Much of the success of this program may be traced to the rigid enforcement of a quarantine period lasting 120 days or longer, at the discretion of the territorial veterinarian. This quarantine is imposed on all imported dogs and cats except those from Australia and New Zealand, which are also rabies free. The quarantine regulation was established in 1912 and has been maintained continuously since that time.

Three Steps for Controlling Rabies

Public health measures for rabies control and eradication can be successful in any community only when it is backed by private practitioners of medicine and veterinary medicine.

More than 40,000 people take the Pasteur treatment annually. This is a costly and a painful procedure and could be eliminated if rabies were eradicated by following three simple steps: (1) Control the stray dog. Some 28 per cent of all positive Negri body heads are from dogs of this type. (2) Mass immunization. When 70 per cent of the dogs in a community are vaccinated an outbreak subsides. (3) Control the wild animal reservoirs by preventing or correcting over-population.—*J. H. Steele, D.V.M., Georgia.*

Rabies-Control Program in New Jersey

The program for rabies control in New Jersey was established in 1947 under authority granted by the director and acting state commissioner of health and the public health council. In June of 1948, state-participating vaccination clinics were initiated as an integral part of the plan and annual antirabies vaccination plays an important role in this program.

The New Jersey program is based upon two prophylactic procedures,—dog management and dog vaccination. Dog management embraces such criteria as

1) licensing and registration of dogs;
2) taking an annual canvass of dogs;
3) the apprehension and disposal of stray and unlicensed dogs;
4) written notice of quarantine for ten days for any dog that has bitten a person;
5) safe isolation or destruction of any animal known to have been bitten by a rabid animal, or an animal suspected of being rabid;
6) quarantine, when rabies is known to exist in a community and there is danger that it may spread.

Although dog management reduces the incidence of the disease, vaccination is necessary to consolidate the gains and prevent reintroduction of the infection. Under this plan, rabies has been effectively controlled in most of the counties in New Jersey and has been entirely eliminated from at least two,—Mercer and Monmouth.—*J. S. McDaniel, D.V.M., in New Jersey Muncipalities.*

Antirabic Vaccination Solid.—Garberi (*Profilassi*, Italy, Oct., 1948) gave antirabic vaccination a severe test by inoculating fixed rabbit and canine virus and also street virus into the substance of the tongue of dogs. Though the inoculations were regularly positive in unvaccinated dogs, dogs challenged fifteen days after vaccination regularly resisted intralingual inoculations of the same severity.

For the treatment of animals exposed to rabies, the dose of vaccine is ½ cc. per pound of body weight. This dosage apparently is more effective if one half is given first and the other half one or two days later. For a 40-lb. dog, the procedure would be to give 20 cc. at once and the remainder either at a single injection in two days, or divided into two additional doses of 10 cc. each at 48-hour intervals.—*Glen L. Dunlap, D.V.M., Missouri.*

Rabies Is a Global Problem

Rabies continues to be world-wide in distribution and uncontrolled for several reasons: (1) the long period of incubation of the virus and its wide distribution by numerous carnivorous hosts; (2) the lack of sustained interest in its eradication; (3) the unpopularity of forensic action against "man's best friend" (compulsory muzzling, confining, vaccinating); and (4) the unrestrained roaming and shipping of dogs between geographic areas (towns, counties, states, countries). This is the summary of an article entitled "Twenty-Five Years of Antirabic Vaccination of Animals" by Remlinger and Bailly (*Bull. Acad. Vét.*, Feb., 1950).

The United Nations reported 1,290,758 persons bitten during the eighteen years ending in 1946. Of these, 4,023 (0.31%) died of rabies. Briefly, the distribution is as follows: The United States is the horrible example; in 1947, 8,916 cases of animal rabies were reported, and of these, 6,949 were dogs. These dogs bit 500,000 persons, of whom 27 died of rabies.

In Turkey, 17,000 persons were bitten in two years, and this resulted in the institution of a compulsory vaccination program.

In Chile, 70,000 dogs and 257 other animals were killed by government functionaries at a cost of $250,000.

In Spain, so many persons were bitten in 1946 that a compulsory vaccination program was started.

In Bulgaria, where rabies had previously been considered unimportant, the dogs of the shepherds were found to be propagators, and rabies has become a serious public health problem.

In China, 19 persons died in the Shanghai hospital in 1944 of rabies. During the nine years immediately preceding this, 132 persons died in this one hospital—most of them children who had been bitten by dogs.

In France, an energetic campaign resulted in only 150 persons being bitten and treated at the Pasteur Institute in 1948.

The rabies-free countries, Norway, Sweden, Denmark, Great Britain, Australia, Hawaii, and Puerto Rico have amply demonstrated that such simple procedures as quarantine of newly introduced dogs and rigid control of the resident dogs will control rabies.

Tenesmus is the most common symptom of rabies in the cow. The straining is most often confused with coccidiosis, white heifer disease, injury from insemination, especially through the imperforate hymen, and sometimes to other causes. Later developments in the picture of rabies are a paralyzed tail, knuckling of the fetlock, anorexia, bellowing, switching, holding the tail to one side, remaining apart from the herd and, finally, death in convulsions.—*F. H. Fox, D.V.M., New York.*

Rabies virus is found in the salivary glands of dogs experimentally inoculated.—*G. L. Dunlap, D.V.M., Missouri.*

The Price of Disease Control

Assuming that the veterinarians of Iowa have an annual gross income of $10 million from the swine practice and that the value of the Iowa pig crop is $930 million annually, Dr. Lester Proctor (ISC '34), of Oelwein, calculates that the cost of the veterinary service is a little over 1 per cent of the value of the animals. He then raises the question, "Is this too big a price to pay for disease control?"...

An acre of good pasture makes the hog producer more net profit than any other acre on the farm providing that it is good legume pasture....

Dr. Proctor concludes his remarks with the statement that "There is satisfaction in serving an appreciative clientele."—*Iowa Veterinarian, 21, (March-April, 1950): 5.*

The value of the ring test rises as the rate of brucellosis infection drops.—*M. H. Roepke, Ph.D., Minnesota.*

NUTRITION

Recommended Nutrient Allowances for Horses

Pasture is the best natural feed and the best source of nutrients for horses. Horses worked during the day should be pastured during the night.

Timothy hay is considered the standard roughage for horses and the widespread prejudice against legume hay is based partly on the fact that it should not be fed in unlimited amounts.

Oats are considered the ideal concentrate for horses, but corn and barley, when cheaper than oats, may be fed satisfactorily.

Horses are particularly susceptible to injury from damaged feeds of any kind.

At least half the fetal protein (about 10.8 lb.) is deposited during the last quarter of pregnancy. The accepted practice of keeping mares on a maintenance ration during all but the last quarter of pregnancy seems reasonable in view of the fact that fetal growth is extremely low during the first three-fourths of the pregnancy period.

—*National Research Council*

Fig. 1—The separation of the hoof from the foot of a horse that died after it had been on seleniferous feeds for only eight weeks.

Minerals

The proper development of the skeletal structures is essential in the horse and mule, and this means that mineral nutrition is of paramount importance. Unless the skeletal structures are strong, the strain and stress of the muscles upon these bones will cause troubles which interfere with maximum production of work and speed.

Calcium and phosphorus are especially important because their absence or deficiency leads to osteoporosis, osteodystrophia fibrosa, and similar conditions. Rarefaction or softening of the bone may develop gradually, with an intermittent shifting lameness which seems to have no obvious cause. The first observed symptom is likely to be a characteristic shortening of the stride of either the front or hind legs or both. While standing, the animal usually shifts its weight, thus resting alternately the affected parts. Lameness is increased by weight bearing and it becomes more marked as the disease progresses, with the stride becoming exceedingly short. Advanced cases may show enlargement or proliferative changes of the facial bones.

Sodium, potassium, and chlorine are all essential to normal physiologic performance of the horse. The amount of sodium chloride lost through perspiration is unknown, but a good plan is to provide an ample quantity of salt *ad libitum*.

Iodine is essential for reproduction and

Condensed from Recommended Nutrient Allowances for Horses, Committee on Animal Nutrition, National Research Council, 2101 Constitution Ave., N. W., Washington 25, D. C. March 1949. 29 pp. Paper. Price 50 cents.

normal physiological processes, being useful through the thyroid gland as the hormone, thyroxine. The most effective means of supplying the small amount of iodine needed by horses is through the use of iodized salt.

Although cobalt and copper are essentials for cattle and sheep, there are no authentic reports of horses suffering from a deficiency, even in those areas where

—*National Research Council*

Fig. 2—Saggital section (right) of the distal end of femur of deficient animal compared to normal bone (left).

cattle and sheep show such deficiency. The horse, therefore, apparently needs no cobalt or needs much less than either sheep or cattle.

Selenium toxicity, or alkali disease, is also called blind staggers and other local names. The characteristic symptoms are loss of the long hair from the tail and mane. Frequently, a ring appears on the wall of the hoof (fig. 1) just below the coronary band and, in advanced cases, the hoof gradually separates from the foot and may be sloughed off.

Fluorine toxicity may be seen when horses are fed untreated rock phosphate.

Excessive amounts of manganese may cause forage anemia which is indicated by anemia, decreased blood volume, and low red cell count.

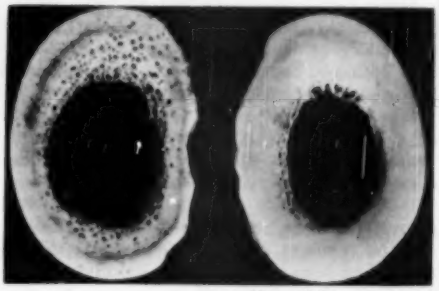
VITAMINS

In general, it is easier to supply an adequate amount of the several vitamins to horses than to most other domestic animals.

Carotene is present in ample amounts in the rations of horses which are fed a good quality of hay or if pastured on a good quality of grass. Lack of sufficient carotene or vitamin A will be indicated by failure of mineralization of the Haversian systems of the long bones of the leg (fig. 2, 3).

Vitamin D is usually present in sufficient quantity where horses are worked regularly and are exposed to sunshine. Seldom do such horses need added amounts of vitamin D.

Although there is synthesis of the B vitamins in the intestinal tract of the horse, this usually occurs in the cecum and it is doubtful if these vitamins are absorbed to any extent. Therefore, horses may show evidence of B vitamin deficiency by emaciation, anorexia, and incoördination of movement.



—*National Research Council*

Fig. 3—Cross section (right) of cannon bone from deficient animal compared with normal bone (left).

Vitamin E deficiency has not been demonstrated experimentally, and there is little evidence to indicate that sterility or infertility in horses can be successfully treated by administering supplementary amounts of vitamin E or of tocopherol.

Ascorbic acid does not appear to be a dietary essential, in so far as experiments can demonstrate.

Founder appears to be a nutritional disturbance in that it can be produced by administering 10 Gm. of histidine together with a culture of *B. coli*, or by the intravenous or subcutaneous administration of histamine. The characteristic symptoms of muscle tremors, anorexia, increased respiratory rate, lesions of the hoof, fever, and sometimes death can be produced by either of these methods of approach.

EDITORIAL

The Release of Scientific Information

Do you remember "'way back when" veterinarians learned about new developments or even new discoveries in veterinary medicine by attending professional meetings or by reading about them first in their professional journals? Perhaps not, because those channels are not today—and have not been for several years—commonly used for the first reporting of so-called scientific advancements.

Now, every governmental agency, every commercial company, and almost every important educational and research institution seems to have its "information specialist," publicity department, or publicist primed to get out a news story at the drop of a test tube or an idea. Judging from "what we see in the papers," these publicists must be peering over the shoulders, so to speak, of the government officials, research workers, and clinical investigators, for the moment a pronouncement is made, and when some new finding seems to show promise, they dash off a release to the popular or lay press.

What is the result? So far as the practicing veterinarian is concerned, unless he is an avid reader of newspapers, agricultural journals, and the popular magazines, his clients will be telling *him* about new methods, new "wonder drugs," or what have you. Not only do they tell him, but they expect him to be ready to employ every new method, drug, vaccine, or operation that has been noised abroad. If he has not caught up to the ballyhoo, the client thinks the veterinarian is behind the times. Actually, in most cases, the wise practitioner is waiting to receive a well-substantiated report on the value of the new procedure or product before using it. As one veterinarian put it, "I never know, any more, when a client is going to walk in to my office with his dog under one arm and a paper under the other and ask me to give Fido the new 'wonder drug' he has just read about."

A few examples may show what we are shooting at.

A recent USDA release said that department veterinarians "urged early and increased doses of anti-hog cholera serum as the surest means of protecting against widespread appearances of the disease this year." The release discussed the trouble encountered with the variant virus last year and recommended that the standard dose of antiserum be increased 50 per cent. In addition, the cost of the additional antiserum was given as "about 10 cents" for suckling pigs and "about 25 cents" for 90-lb. pigs. This release, apparently, was sent to the lay and farm press and to professional journals on the same day. Immediately, newspapers and farm magazines began publishing the story. Good publicity for the Department, perhaps, but where did it leave the practicing veterinarian, the man often referred to by the USDA as the "guardian of the nation's livestock"?

Recently, a commercial company announced a new type of rabies vaccine. Even though the government license for this product limits its distribution to veterinarians for experimental use, at least for the present, the announcement and descriptive brochure about the new vaccine hit the editor's desk of a large city newspaper at the same time it reached the AVMA office. The result? This particular editor phoned the Association's headquarters to ask, "What does the veterinary profession think of this new product?" The profession hasn't had time, yet, to make up its mind.

In spite of the eagerness of all of us to be first with the newest news, does it profit in the long run to build false hopes? The real facts will still have plenty of time to accomplish the good of which they are capable.

Don't get us wrong. We are advocating neither a return to smoke-signal or pony-express methods of communicating infor-

mation nor that an iron curtain be dropped between the public and scientific workers. But the release of scientific information in a form for popular consumption cannot give the professional man the detailed facts he must have before he can safely adopt a new method or use a new drug, wonderful though it may seem. On the contrary, a sensational story about a "revolutionary discovery" makes the veterinarian and other professional men all the more skeptical and cautious.

We have no illusions about changing the *status quo* of modern, high pressure, publicity methods. They are too much a part of the American scene and *too many persons are making a living from them* to expect that any change will come about. So, to end this criticism with a constructive suggestion or, rather, question or two: How about *different* and *separate* releases for the professional outlets as compared to the lay press? And how about giving the professional man, whose knowledge, understanding, and coöperation are fundamental to the successful application of a new idea or product, just a little break over the general public he is trying to serve intelligently and safely? What we are suggesting is, perhaps, an *ethical* and *professional* approach to dissemination of scientific information and news as compared to a purely *trade* approach. Too idealistic? We don't think so. Not feasible? We believe it is.

Lift the Veil of the Near Past

Picture the veterinary service of the United States just seventy-five years ago. Count the college-trained veterinarians. Visualize the country's agricultural industry stumbling along without attention to the health of livestock. Paint the canvas with the perils of animal diseases in the hands of quackery galore. Take a good look at legislative opposition to animal-health programs. Comb the statutes for laws frankly intended to promote clinical veterinary medicine. Consider the potentiality of bovine contagious pleuropneumonia, piroplasmosis, glanders, equine influenza, tuberculosis, anthrax, blackleg, hog cholera, and sporadic ailments. Note the absence of veterinary colleges. Until you have lifted the veil from the complete picture of seventy-five years ago and have studied its details, your education lacks the polish the historian would have you possess. A rounded veterinary education includes whence you came, where you are, and where you're going.

Re: Military Status of Veterinarians

In view of the current military situation, the AVMA has increased its efforts to determine the status of veterinarians in the event of a broad mobilization of United States resources. At the time of going to press, no official word had been received from the Armed Forces regarding the prospective need for veterinarians. It is understood that the total mobilization, if necessary, of all resources, including personnel, has been delegated to the National Security Resources Board.

The draft status of students in professional and preprofessional schools was last stated about two years ago in Selective Service Local Board Memorandum No. 7, dated Nov. 2, 1948. An inquiry has been directed to Selective Service Headquarters in an effort to determine whether the same policies are still in effect. The status of students and of veterinarians holding Reserve appointments in either the Veterinary Corps or other branches of the Armed Forces is also being investigated. The deans of the colleges of veterinary medicine have information and suggestions for determining the status of students who hold reserve appointments in any branch of service.

The executive office of the Association will keep in touch with developments, and will relay new information to interested persons and agencies as promptly as possible.

Cost of Slaughterhouse Blue Prints

The cost of the sets of blue prints referred to in "A Basic Abattoir Project" by Dr. Harry E. Shepherd, in the July, 1950, JOURNAL (pp. 30-38), was inadvertently omitted. The price of the complete set of seven sheets is $25.00 to members of the AVMA.

As builders of practice and prestige, surgery and obstetrics have no equal. They are the trustworthy fencing of the practitioner's fold—"bull strong" and "hog tight."

CURRENT LITERATURE

ABSTRACTS

Newcastle Disease Virus Photographed

The mouse-adapted strain of Newcastle disease virus was enlarged 72,900 diameters and photographed under the electron microscope. It is expected that this method of research will open up new avenues to the study of diseases of animals and human beings.—[*R. L. Reagan, J. W. Hickman, and A. L. Brueckner: Electron Micrographs of the Mouse-Adapted Newcastle Disease Virus. Am. J. Vet. Res.*, 11, (*April*, 1950): 231-232.]

The Pathogenesis of Mastitis

Alterations observed in the mammary gland in acute mastitis indicate that the causative agent spreads rapidly throughout the quarter by way of the duct system. The inflammatory irritant may be lactic acid, endotoxins, or an exotoxin, or a combination of these. Once the inflammatory reaction begins, other factors seem to aid bacterial activity.

In cases of acute mastitis, there was an acute, diffuse, exudative inflammation, and sometimes extensive necrosis. In chronic streptococcic mastitis, there was both chronic interstitial and acute focal inflammation.

In all instances, the lesions were more extensive and more severe in the ventral portion of the gland than in the dorsal portion.—[*G. R. Spencer and S. H. McNutt: Pathogenesis of Bovine Mastitis. II. The Pathologic Alterations in Twenty-Five Mammary Glands. Am. J. Vet. Res.*, 11, (*April*, 1950): 188-198.]

Hormones and Reproduction

The rate at which hormones are secreted under the various reproductive states was studied. The estrogenic activity of cow urine is very low during the first one hundred days of pregnancy and then increases steadily to term.

On the other hand, the urine of the pregnant mare is an important source of estrogen for clinical use. Most investigators find that the estrogen reaches a very high level during the seventh and eighth months of pregnancy beginning at a low point and building up gradually to this high and then falling off again to the time of parturition. Only one author has reported a constant and steady rise to the time of parturition.

There is no evidence to indicate that progesterone is ever excreted in an active form.

The urinary androgenic content of most animals is very low. However, androgenic activity has been demonstrated in the feces of cows, and it is believed that the active substance is in the neutral ketonic fraction. Bull feces are lacking in this androgenic activity, and it is interesting that the same lack appears in cystic ovary cows. The androgenic activity of cow feces builds up to a high at about the time of parturition, but there is some difference of opinion as to whether the high point is reached at and immediately following parturition, or whether it is reached just before and falls off quickly following calving.

The nature of the ration being fed has a profound effect upon the amount of androgen in the feces, roughage providing a much higher androgen content. This material is readily destroyed by heat.—[*H. H. Cole: The Excretion of Steroid Hormones Concerned with Controlling Reproductive Processes in Animals. Am. J. Vet. Res.*, 11, (*April*, 1950): 161-165.]

Mastitis Treatment with Subtilin and Bacitracin

Clinical trials in the treatment of bovine mastitis were disappointing in that neither subtilin nor bacitracin proved to be superior to agents now available for treating this disease.—[*J. O. Heishman: Report on Subtilin and Bacitracin as Possible Treatment for Bovine Mastitis. Am. J. Vet. Res.*, 11, (*April*, 1950): 206-210.]

The Brucella Ring Test

The ring test was positive in two of three herds classed as infected on the basis of the blood test results; the failure of the ring test to detect reactor herds was due, in two cases of three, to the fact that the infected animals were not in production at the time the test was made. Nine of ten herds in which reactor animals were in production were positive to the ring test.

It is suggested that one county-wide ring test may be expected to locate 50 to 60 per cent of the infected herds, while two tests, six months apart, should disclose from 75 to 80 per cent of the reactor herds. These conclusions are based upon the results of tests on 30,811 herds. Among this group, 107 infected herds were negative to the ring test, and, of these, 69 (65%) were herds in which the reactor animals were not in production when the test was made.

The general conclusion seems to be that the test is valuable on a survey basis and that it helps to focus attention of veterinarians upon those herds

in which infection is present. Herds that are negative on the ring test are, in a vast percentage of cases, free from brucellosis.—[*M. H. Roepke, K. G. Paterson, F. C. Driver, L. B. Clausen, L. Olson, and J. E. Wentworth: The Brucella Abortus Ring Test. Am. J. Vet. Res.*, 11, (*April*, 1950): 199-205.]

Thyroidal Stimulation in Dogs

Protamone had four to eight times the potency of desiccated thyroid (50% stronger than U.S.P.) as judged by their calorigenic effects on thyroidectomized dogs. Both caused a transient drop in the metabolic rate on the seventh to eighth day of dosage.

The therapeutic range may be estimated at from 1 to 2 mg. per kilogram per day of protamone, and 6 to 12 mg. per kilogram per day of desiccated thyroid U.S.P.

Thyroidectomy resulted in a 27.8 per cent drop in the metabolic rate and a decline in pulse rate and body temperature.—[*R. F. Borgman and E. P. Reineke: The Response of Thyroidectomized and Intact Dogs to Thyroidal Stimulation. Am. J. Vet. Res.*, 11, (*April*, 1950): 149-156.]

Chlordan Toxicity

Chlordan proved poisonous to 1-week-old chicks when fed at concentrations ranging from 0.10 to 0.25 per cent of the total ration. Deaths were recorded as early as the first day. Resistance to chlordan poisoning increased markedly in the several age groups. Birds 21 days old died first on the second day, those 63 days old on the fourth day, and those 112 days old on the eighth day, using 0.25 per cent chlordan.

On the other hand, laying pullets are highly refractory to chlordan poisoning, but they did respond by molting, ceasing of production, losing body weight, and reducing feed consumption.—[*M. M. Rosenberg, T. Tanaka, and H. E. Adler: Toxicity of Chlordan to Growing Chickens*, 233-235. *Toxicity of Chlordan to Laying Pullets*, 236-239. *Am. J. Vet. Res.*, 11, *April*, 1950.]

Johnin and Tuberculin Tests

A study of 855 johnin intradermal tests gives some clue to the manner in which intradermal injections produce a reaction. The experiments reported suggest that a greater sensitivity exists on the neck region; that the optimum time for making observations appears to be forty-eight hours after injection; and that a new injection site is preferable when repeated tests are made at intervals of three months or less.

When the same number of tests was made using mammalian tuberculin intradermally on cattle that were naturally infected with Johne's disease, it was found that animals infected with Johne's disease are sensitive to mammalian tuberculin and that the sensitivity seems to persist in many animals for several months. Positive reactions, in many instances, remain seventy-two hours or longer after injections are made.

There may be some hint in this work regarding a method of handling those herds in which no visible lesion (NVL) cases are repeatedly found on tuberculin test.—[*Dennis Sikes and A. H. Groth: Studies with the Johnin and Tuberculin Intradermal Tests in Cattle Naturally Infected with Mycobacterium Paratuberculosis (Johne's Disease). Am. J. Vet. Res.*, 11, (*April*, 1950): 181-187.]

Persistence of Brucella Infection in Cattle

Slightly more than 80 per cent of the cows studied persistently eliminated *Brucella abortus* in the vaginal discharges for one month following parturition. Then the incidence of recoveries decreased rapidly during the next four months. One cow remained infected for 101 weeks.

Blood stream infection persisted for five months in a high percentage of recently infected, unvaccinated cattle, and such infection persisted in 1 cow for as long as 97 weeks.

In general, Brucella infection in the blood and genital tract was highest near termination of the first gestation following exposure. There was no major difference in the course of brucellosis between artificially and naturally infected cows. The infection localizes most frequently in the udder and supramammary lymph glands of cattle.—[*C. A. Manthei and R. W. Carter: Persistence of Brucella Abortus Infection in Cattle. Am. J. Vet. Res.*, 11 (*April*, 1950): 173-180.]

Canine Anemia and Hypoproteinemia

Simple anemia produced by bleeding can be tolerated by the adult dog continuously during its entire life history. Simple hypoproteinemia can be maintained in adult dogs for years. However, double depletion—anemia plus hypoproteinemia—is a severe strain on the dog and can be tolerated continuously only for a few months.

Experiments to help control blood protein output, so that more plasma protein would be produced on one diet and more hemoglobin on another diet, are providing some favorable results. In some of these experiments, egg and egg albumin show a little more plasma protein produced than hemoglobin and, in contrast, meat and liver show three or four times as much hemoglobin produced as plasma protein.

In doubly depleted dogs, casein, either purified or commercial, falls in the top bracket as a protein consistently favorable for maximal new hemoglobin and plasma protein production. Lactalbumin is somewhat less favorable and peanut flour is less than half as effective as casein. Wheat gluten is distasteful to dogs. Liver remains the control base line for all protein production studies.—[*F. S. Robscheit-Robbins and G. H. Whipple: Dietary Effects on Anemia Plus Hypoproteinemia in Dogs. J. Exptl. Med.*, 89, (1949): 339-368.]

BOOKS AND REPORTS

Pharmacopeia of the United States of America

Like its predecessors, this volume provides standards for drugs and medicines of therapeutic usefulness or pharmacopeial necessity. It also lays down tests for the identity, quality, and purity of these drugs. The general form of the book is the same as that of previous editions with which all veterinarians are familiar. This revision carries many items which were added for the first time, and it drops a number of items which were official in the thirteenth and fourteenth editions of the Pharmacopeia.

The nature of the book is such that all of the necessary information is contained therein except dosages for animals. These are not included, and the only dosage given is the usual human dose.—{*Pharmacopeia of the United States, 14th revision, and the 1st USP 14th supplement, by authority of the United States Pharmacopeia Convention, Inc. Cloth. 1,067 pages. Mack Publishing Company, Easton, Pa. 1950. Price $9.00.*}

The Principles of Anatoxins

The world is not generally aware that the founder of the anatoxin system of immunization, which practically exterminated diphtheria and tetanus from the face of the earth, is Gaston Ramon, veterinarian, alumnus of Alfort, longtime director of Institut Pasteur, intrepid laboratorian, and fluent writer who now publishes a masterpiece on the principles involved in his life's work which he proudly dedicates to his profession, to wit: *En hommage a la profession Vétérinaire et a la Mémoire du Emile Roux disciple de Pasteur* ("In homage to the veterinary profession and in memory of Emile Roux, disciple of Pasteur").

Seldom, if ever, has veterinary medicine received a higher tribute, for, in the natural course of events the author's name is being engraved among the foremost scientists of the world. He developed and perfected an effective method of immunizing man and animals against deadly infections, discarding the notion that only live, disease-producing material (vaccine) is capable of producing antibodies. In other words, Ramon was able to refute the idea of Jenner and Pasteur by successfully separating the disease-protecting from the disease-producing elements of the infective process, and thus developed the new system of immunization now superseding the old one, all over the world.

This new book is a condensation of about 600 monographs on the special domain of immunology which the author had been developing since 1922. It exposes, in abridged form, research work of twenty-eight years, pursued without surcease, and examines for comparison the jennerian and pasteurian systems which the anatoxins were intended to replace, even for the production of antitoxins without the use of a living germ.

An interesting slant is the use of mixed anatoxins in single doses to immunize against two or more diseases (diphtheria, tetanus, whooping cough, typhoid fever, etc.).

Thanks to the author's numerous publications, medical science was kept so well informed on the developments of toxoid-produced immunity through the years that there was never any sensational announcement of the great achievement. A 38-page account, sketching the salient steps of this research in the order published in contemporary literature, is proof that Ramon had to learn by long years of trial and error that antibody-producing reactions are not entirely dependent upon the growth of organisms in the living body, and thus demonstrated that immunologists had some revising to do.

No scientific library or reader of French in the field of medicine is likely to remain long without possession of this book.—*The Principles of Anatoxins and Their Application (title trans.). By Gaston Ramon, former director of the Pasteur Institute. 230 pages. Masson et Cie, Paris. 1950.*

The Merck Manual

The golden anniversary edition of "The Merck Manual" presents a wide variety of facts which are interesting to clinicians throughout the country and the world. The book almost defies reviewing in the space available, and it is possible for this reviewer only to call attention to a few of the highlights and to indicate the scope of the work. For example, Part I contains 338 chapters on the diagnosis and the treatment of diseases. Each is considered from the point of view of symptoms and signs, diagnosis, and treatment. At the end of each chapter is a group of prescriptions which are valuable in that field.

The book is new to the point of containing information released up to May 1, 1950. Its chapters on nutritional deficiencies, the radiation reactions and injuries, allergies and the antihistamines, the antibiotic agents and their uses, and even such new products as cortisone and ACTH are treated in detail.

We know of no book which presents in such concise and yet detailed manner the information available in this book. It is thoroughly indexed and a thumb-index volume is available. Although written primarily for the physician, much of the information may be applied also to veterinary practice and every practitioner of veterinary medicine should have a copy of this book on his desk or in his car.—{*The Merck Manual of Diagnosis and Therapy. 8th ed. Cloth. 1,592 pages, 4½ by 7 inches. Merck and Co., Inc., Rahway, N. J. 1950. Price $5.00 (thumb-index edition); $4.50 (regular edition).*}

Special Surgery

The book is divided into sections on surgical diseases of the head, neck, chest, body, front limbs, rear limbs, and the hoof and claw. While devoted chiefly to the surgical diseases of the large domestic animals, conditions frequently seen in the dog and cat are also included.

For each condition discussed, the text enumerates the steps by which a diagnosis may be made and the means by which it may be differentiated from all other conditions, including not only symptoms but other aids to diagnosis. This is then followed by a discussion of the method of handling the case, not only surgically but from the standpoint of after-care and medicinal treatment when this is indicated.

There is a general indication that the surgical methods and procedures described are not on a par with the advanced American standards. This is exemplified in the instruments used in surgery, the after-care recommended, and particularly in complete absence of such newer developments as intramedullary pinning and other types of fracture fixation with pins and splints.

The book is nicely prepared, very well illustrated, printed on a good quality of paper, and would undoubtedly serve a useful purpose in the library of a faculty member or someone doing surgery regularly. However, in the library of the average practitioner, it would offer little which would improve the quality of service being rendered.—[*Lehrbuch der speziellen Chirurgie fur Tierärzte. By Erich Silbersiepe and Ewald Berge. 11th ed. Cloth. 524 pages, 457 illustrations. Ferdinand Enke, Stuttgart, Germany.* 1950. *Price 42 marks.*]

Dog Owners Guide

The dedication of this book says "If man would try to understand his dog as well as his dog understands him, they could speak a common language," and the book goes on from there to help the man to understand his dog. Using a highly effective combination of words, pictures, and cartoons, the book does a good job of telling an owner what kind of a dog to get, how and when to feed, and some of the basic factors in training the dog.

In the paragraph on health, the book emphasizes the importance of keeping a dog healthy and the greater satisfaction of preventing disease instead of treating or curing it. With this in mind, health is discussed from the preventive point of view and not from the "doctor book" approach. Hence, treatment discussions are restricted to those which the owner can logically be expected to do and, at the same time, the owner is instructed to take his dog to a veterinarian whenever a serious condition may be suspected.—[*Dog Owners Guide. By Kasco Mills, Inc. Paper. 138 pages. Profusely illustrated. Kasco Mills, Inc., Toledo, Ohio, and Waverly, N. Y.* 1950. *Price* $1.00.]

Received But Not Reviewed

Annual Report, 1949. Animal Disease Control and Prevention of Shipping Losses. National Live Stock Loss Prevention Board, Sioux City, Iowa. 23 pp.

M—Vaccine in Bang's Disease. Subcommittee on Research, National Brucellosis Committee. Mr. W. D. Knox, Secretary, Fort Atkinson, Wis. 7 pp.

REVIEWS OF VETERINARY MEDICAL FILMS

Training You to Train Your Dog (Advanced).—Sound, 16 mm., color; running time about twenty-five minutes. Produced by and procurable from the Gaines Dog Research Center, 250 Park Ave., New York 17, N. Y. This picture carries on into the advanced training stages in dogs. It was prepared by United Specialists and shows the steps in the training and examination of dogs for the titles C.D.X. (companion dog excellent), or the title U.D. (utility dog).

The picture shows how the dog is trained to carry a dumb bell and surrender it, to jump a hurdle with the dumb bell, how to retrieve and return on call. The training to sit, to "heel," and to retrieve are all shown in considerable detail, and with more than one dog.

After this basic training, the film shows how the dog is trained to jump over a solid hurdle, a bar hurdle, and finally over the long jump. Each type of hurdle requires a different technique, and in each instance the physical stature of the dog must be considered in providing hurdles of appropriate height. In addition to the mere jumping, the picture shows how the dog is trained to retrieve a dumb bell over the hurdle, to return it to the owner. Steps shown in teaching the dog to "speak" and to stop barking are also shown.

The final and most difficult portion of the training program shown consists of teaching the dog to trail a scent from a starting point. This consists of several stages, shown carefully, so that anyone wishing to train his dog can follow the steps outlined and achieve the same results. This training is also useful in teaching dogs to find items lost by the owner, whether or not the dog knows when or where they were dropped. This film acquaints the veterinarians with the procedure involved in the training of a dog. It also will be of real interest to dog owners who wish to train their dogs thoroughly.

Man's Best Friend.—Sound, 16 mm., color; running time about thirty minutes. Produced by and procurable from the Gaines Dog Research Center, 250 Park Ave., New York 17, N. Y. Not available for showing in California, Washington, Oregon, Nevada, Utah, Idaho, or Arizona. This picture illustrates some of the training to which

dogs are subjected in the obedience training classes. These various activities are considered rather hurriedly, but one by one in logical order as the dog goes through them. The film then goes on to a listing of representative animals from each of many common breeds of dogs.

The next phase shows dogs on field trial and on actual hunting expeditions,—locating birds in the field, pointing, and retrieving.

Another section deals with working dogs or sheep dogs, showing how they are trained and how they respond to the signals given by the trainer when actually at work with sheep. The final section of the film deals with the breeding, growing, and training of guide dogs for the use of blind and otherwise disabled persons who find the assistance of such dogs valuable in their daily activities.

This film, designed primarily for showing to lay groups, will serve to show the value of a well-trained dog. Veterinarians will find the film interesting and educational too.

Ascariasis (PMF 5124).—Sound, 16 mm., black and white; running time about twenty minutes. This is an English language, sound version of a German film produced by the I. G. Farbenindustrie at Frankfurt-am-Main, Hoechst, reproduced and available from the U. S. Army. Requests should be sent to the AVMA Motion Picture Film Library so that applications may be submitted on the proper form and to the proper Army Headquarters.

The photography and the content of this film present a truly wonderful accomplishment. Even though the film is old, it reproduces nicely and the interesting and informative pictures illustrate most of the important phases of ascariasis. A diagram shows the migration of the larva through the pig's body, followed by pictures of the larva in an egg, leaving the egg, in the intestine, migration to the liver, heart, lungs; photomicrographs of the larva in the blood, and pictures of the mature ascarid. One unusually fine shot is a picture of the female ascarid with the uterus exposed. There is also a picture of the ascarids copulating and of the female laying eggs. To show that ascariasis is not a problem only in hogs, there are pictures of ascarid eggs from human beings on vegetables, and mature ascarids in the human intestine and bile duct, and in the intestines of horses, dogs, pigeons, and a python.

This picture will be extremely interesting to all veterinarians and veterinary students. Primarily designed for showing to professional audiences, it contains a world of good information about ascariasis and, with some explanation, would serve well for lay audiences.

Cushing's Experiment with the Dog (PMF 5111).—Sound, color, 16 mm.; running time about fifteen minutes. Produced by and procurable from the U. S. Army. Requests should be sent to the AVMA Motion Picture Library, 600 S. Michigan Ave., Chicago 5, Ill., so that applications may be submitted on the proper form and to the proper Army Headquarters.

The dog is employed to show the effect of intracranial pressure on respiration, blood pressure, and pulse rate in this film. The procedure and technique employed is described in detail and excellently photographed. The equipment used is explained further by the use of diagrammatic illustrations and explanations. The effect of the pressure on the brain is then recorded on kymographs as the blood pressure, respiratory rate, volume, and pulse rate are affected. External symptoms of increased intracranial pressure are also shown.

This, as most Army films, is well photographed and thoroughly explained. It should certainly be of interest to students and probably also to graduates. Although concussions or other conditions which increase the pressure on the brain are not commonly recognized in veterinary medicine, it certainly behooves veterinarians to be familiar with the symptoms which result. No doubt, small animal practitioners will find the film both interesting and informative. Not suitable for showing to lay audiences.

Sentinels of Milk.—Sound, 16 mm., color; running time about twenty minutes. Produced and supervised by C. S. Bryan, W. L. Mallmann, and G. M. Trout, of Michigan State College; and F. R. Towne and G. J. Turney, Lansing (Mich.) Health Department. Procurable from Capital Film Service, 224 Abbott Road, East Lansing, Mich.; rental $5 per day; sale price $150.

The purpose of this film is to outline the fundamentals necessary for the production of good, clean, wholesome milk. The four sentinels of quality milk production shown are: (1) cleanliness, (2) health, (3) quality, and (4) safety. These sentinels are depicted by showing the various steps essential for the production of high quality milk. The use of the strip cup, collecting milk samples in the barn, a good milk house, thorough cleansing and sanitizing of utensils, and having clean, healthy cows are some of the factors pointed out as being absolutely essential. There are also illustrations and depictions of the effect of temperatures on bacteria, the effect of sanitizing and cleaning milking equipment, and milk being sampled and tested for quality before and after bottling. The section illustrating how milk is tested for quality in the modern milk-testing laboratory is quite thorough.

An excellently photographed and well-prepared picture, it is primarily intended for laymen and most suitable for showing to lay groups. It will be of interest to veterinarians and to students of veterinary medicine, but there is not much scientific or technical information included that will be beneficial. Veterinarians will use this film primarily to show the essentials of quality milk production to civic clubs and women's organizations.

THE NEWS

Latest Information on Miami Beach Hotel Reservations

Demands for hotel accommodations during the Miami Beach convention, especially for air-conditioned rooms, have surpassed all expectations, and air-conditioned hotels originally listed have already filled their quotas. Through prompt action of the Local Committee, however, arrangements have been made with other air-conditioned hotels to house AVMA registrants.

Dr. S. C. Wasman, chairman of the Hotels and Housing Committee, reports that a limited number of members making late reservations for air-conditioned and/or oceanfront hotels can still be accommodated at newly selected hotels further away from the Municipal Auditorium. Busses and taxis offer convenient transportation to the Auditorium from all of the newly selected hotels, or persons who drive to Miami Beach can use their own cars.

Members who do not yet have reservations are urged to make them without further delay, using the form provided in the July JOURNAL (adv. pp. 34-35). Choices should be based on rates and types of accommodations desired, as offered by the various hotels. Those desiring air-conditioned, oceanfront hotels should be careful to so select and be sure to list three choices. If the Hotels and Housing Committee cannot obtain rooms at any of the three hotels which members indicate on the form, every effort will be made to provide comparable accommodations at other suitable hotels.

Last-Minute Notes on the Miami Beach Convention

Income-Tax Exemption for Adjourned Meeting in Havana

Inquiries have been received as to whether veterinarians taking the official post-convention trip to Havana will be entitled to deduct the cost of this trip from their income tax. It is an adjourned meeting of the AVMA—being held for scientific purposes—and, as such, all legitimate expenses incurred in attending it are tax-deductible, as are expenses of attending the Miami Beach convention. Cuban veterinarians have planned an excellent program that is sure to make this trip a memorable experience. Dates of the AVMA Adjourned Meeting in Havana are Aug. 25-27, 1950. Those traveling by air will arrive in Havana on August 25 and will return to Miami early in the evening of August 27. Those going by boat will depart from Miami on the evening of August 25 and will arrive in Havana the next morning; the return trip also will be an overnight cruise, leaving Havana on the evening of August 27.

Driving Through Georgia?

Veterinarians and their families who drive to the convention through Georgia will find the following places of special sight-seeing interest, according to Dr. C. C. Rife, secretary of the Georgia Veterinary Medical Association: Chickamauga National Park, on the Tennessee-Georgia border, near Chattanooga, Tenn.; Vogel State Park, in northern Georgia; School of Veterinary Medicine, University of Georgia, in Athens; the Cyclorama, a painting of the Battle of Atlanta, in Grant Park, Atlanta; Stone Mountain, world's largest monolith, 18 miles east of Atlanta; Warm Springs Foundation for Infantile Paralysis, 70 miles south of Atlanta; Golden Isles, on route 17, off the coast of Georgia; and the famed Okefenokee Swamp and Park, on the Georgia-Florida border.

Air Travel to the Meeting

Three airlines—Delta, Eastern, and National—offer flights directly to Miami from major cities in the eastern and central United States. Members traveling from cities not served by any of these three lines should contact their nearest airline office regarding local flights

that make connections with these lines. Members in California should contact American Airlines about the through flight to Miami from Los Angeles, via American-Delta. Some of the lines offer special summer excursion rates on daytime flights to Miami and economy night coach flights, and all of the lines have family travel plans that feature reduced fares for wives and children.

DEEP-SEA FISHING

Fishing enthusiasts are advised by the Miami Beach Chamber of Commerce that boats for deep-sea fishing, accommodating up to six persons, can be chartered for $35.00 for a half day, $65.00 for a full day. For reef fishing, two boats are available at the Miami Beach Chamber of Commerce docks; each holds about 50 people and the charge per person is $3.00 for a half day, $4.00 for a full day. Reservations for charter boats may be made directly to the dockmaster, Miami Beach Chamber of Commerce Docks, Miami Beach.

CAR RENTAL SERVICE

Automobiles can be rented in both Miami Beach and Miami on a drive-it-yourself basis. Information and rates can be obtained from any hotel. Rates for the period August 20-25 are quoted as low as $20.00 plus 8 cents per mile, including adequate insurance.

AVMA Files Protest Against Federal Poultry-Labeling Plan

The Production and Marketing Administration of the U. S. Department of Agriculture is reported to be going ahead with a poultry-grading plan that provides for "qualified plant employees" to examine ready-to-cook poultry and rabbits during the evisceration process, as a prerequisite to grading by the PMA. Such examination of eviscerated poultry by lay plant employees for grading purposes is separate from USDA "inspected for wholesomeness," the latter being under supervision of federal veterinarians.

Although the volume of poultry inspected by veterinarians in federally supervised plants has increased in recent years, it amounts to only about 10 per cent of all poultry marketed.

A notice regarding the new procedure was published in the *Federal Register*, April 5, 1950, and supplementary information was given in the May 12, 1950, issue.

Protest was filed by the AVMA in the belief that the regulations are not in the best interests of the public and all others concerned. Labels of similar design bearing different designations would be confusing to consumers and, therefore, misleading with respect to the adequacy of inspection and the public health protection afforded, it was pointed out. The administrator of the Poultry Marketing Administration was urged to confer with the AVMA Special Committee on Food and Milk Hygiene before taking further action on the plan. Other representatives in the field of veterinary medicine, as well as some public health agencies, also protested.

Washington observers say they doubt the program can be launched without complications, but odds are high that it will go into effect in spite of protests.

Veterinary Pathology Curriculum

The conference on the teaching of veterinary pathology which the American College of Veterinary Pathologists planned to hold this summer did not materialize. The subject is of such importance, however, that the College still thinks it advisable to attempt such a seminar. It is now proposed that such a meeting be held in Chicago on the Friday and Saturday after Thanksgiving Day (November 24-25). It is believed that arrangements can be made with the pathology department of one of the large medical schools in Chicago to use its facilities for such a conference. The Committee on the Teaching of Veterinary Pathology will welcome expressions of interest in such a two-day seminar at which teaching methods, course, content, contact hours, visual aids, laboratory equipment, and size of sections can be discussed. It is proposed that discussions center around the educational methods used on both the undergraduate and graduate levels.—R. A. RUNNELLS, *Chairman, Committee on Teaching, American College of Veterinary Pathologists, Michigan State College, East Lansing.*

Action Postponed on U.S. BAI Intrastate Meat Inspection

A move to extend U.S. BAI meat inspection services to state and local packers on a voluntary basis—announced May 9, 1950, in the *Federal Register*—has been postponed indefinitely.

The plan was designed to provide a federal "inspected and certified" stamp for products of packers selling intrastate only. The term "inspected and certified" was intended to distinguish intrastate products under federal inspection from the well-known "inspected and passed" federal stamp of approval for meats shipped across state and national borders.

According to BAI spokesmen, several intrastate packers asked that federal inspection be provided, on the packer's individual request and at his own expense, and with full understanding that such inspection would not qualify products for shipment across state borders.

In a statement filed with the government, the AVMA affirmed the need for extending the public protection afforded by federal inspection, but questioned whether many plants interested in doing business only within state borders can meet all prevailing federal requirements. It was pointed out that their failure to do so would mean a lowering of the requirements and that this could not

be condoned. Questions also were raised about the manner and extent of participation by veterinarians and implied provisions for extensive use of lay inspectors. The proposal did not give a clear picture of either of these matters, notwithstanding the recognized necessity for final inspection by a veterinarian. The desirability of having practicing veterinarians take part in the program on a per diem basis was emphasized.

Midwest Veterinarians Inspect Purina Research Facilities

Early in June, about 150 veterinarians from Illinois, Indiana, Iowa, and Missouri visited the Purina Research Farm and Laboratories at the invitation of the company. On Monday, June 5, the group was taken on a conducted tour of the research farm of 738 acres near Gray Summit, Mo., where the practical feeding trials on Purina feeds are conducted under regular farm conditions; perhaps it would be better to say that the conditions are practical ones which almost any farmer could adopt if he chose. Demonstrations of feeding trials were shown on the beef and dairy cattle herds; swine; poultry; rabbits and other furbearing animals; dogs; and pheasants. Following the morning tour, a hearty, farm-dinner "lunch" was served, after which Dr. L. M. Hutchings of Purdue University presented an illustrated lecture on "Baby Pig Losses". The inspection of the farm operations was then continued, following which Mr. E. B. Powell, director of research of the Ralston Purina Company, spoke on "Factors Influencing Livestock Production Profits," with living examples of the various points as dramatic demonstrations of what can be done when the formula of "good breeding, good feeding, sound management, and careful sanitation" is used for profitable production.

In the evening, the group was most enjoyably entertained at a banquet followed by a program of outstanding specialty acts by the "Purina Players," a talented group of company employees.

On Tuesday, June 6, the veterinarians were taken on an inspection tour of the research laboratories at Checkerboard Square in St. Louis. This was followed by two talks, "Some Fundamentals of Animal Nutrition" by H. C. Schaefer, manager of the nutrition laboratories, and "Nutrition as Related to Enteritis and Other Swine Disorders" by Dr. R. W. Luecke of Michigan State College. After lunch, Dr. R. E. Lubbehusen, manager of the Purina disease-control laboratories, spoke on "Practitioners and the Feed Industry." In this talk, Dr. Lubbehusen outlined clearly and forcefully the respective fields of service of the veterinarian and feed manufacturer or dealer in their client-customer relationships and pointed out the Ralston Purina Company's policy in such matters.

The whole tour, program, and arrangements for this interesting inspection trip were most capably organized and carried out under the direction of Mr. J. D. Sykes, vice-president, and Mr. Otis O. McIntosh, director of public relations. This is the first, large, organized trip for veterinarians to the Ralston Purina research facilities, although some 12,000 members of farm groups, livestock breeders and growers, and other agricultural groups visit the farm and laboratories each year. The company may invite other veterinary groups in the future; the research work, and practical feeding trials at the farm, are demonstrations from which every practicing veterinarian can obtain valuable information.

In addition to the nutrition studies, one of the most striking factors is the strict program of sanitation enforced in the herds and flocks and their environment on the farm. The results tell the story: for example, 8½ to 9½ pigs weaned per litter for the past four years (two litters per year for some 80 brood sows); very low incidence of calf diseases and losses; 99 per cent of all ducks that are "put down" are raised. To the sanitation-minded veterinarian, the values of cleanliness, disinfection, and thorough application of other disease-control measures are convincingly demonstrated at this farm.—J. G. HARDENBERGH.

Motion Pictures Added to Scientific Exhibits

The scientific exhibits at the Miami Beach meeting will be supplemented by the showing of seven films from the AVMA Motion Picture Library and other sources, in the Municipal Auditorium arena on Tuesday and Wednesday afternoons, August 22 and 23, at 2:30 p.m. each day. The schedule of films to be shown each day will be listed in the official convention program. All the films to be presented, and many others, are available from the AVMA Film Library. A complete catalog of films available to members and veterinary medical associations through the AVMA Library can be obtained by addressing a request to the AVMA Motion Picture Library, 600 S. Michigan Ave., Chicago 5, Ill.

Brucellosis Congress

The Agricultural Board of the National Research Council is sponsoring the Third Inter-American Congress on Brucellosis in Washington, D. C., Nov. 6-10, 1950. The chairman of the Board is Dr. Roy C. Newton of Swift & Company, Chicago. The Council maintains committees on animal health, animal nutrition, milk production and distribution, and veterinary service. The AVMA representative is Dr. E. P. Johnson of the Virginia Agricultural Experiment Station, Blacksburg. Chief B. T. Simms of the BAI is a member of the Agricultural Board.

Pan American Sanitary Organization

The Executive Committee of the Pan American Sanitary Organization approved the budget and health programs for 1951 at its meeting in Washington, D.C., April 17-28, 1950. The provisional budget, as approved, is $1,943,681, and will be submitted for final action at the October meeting of the Directing Council, at which all 21 member republics will be represented.

Projects and campaigns include eradication of brucellosis, hydatidosis, rabies, and other

diseases transmissible from animals to human beings.

STUDENT CHAPTER ACTIVITIES

Alabama Chapter.—Officers who served the Alabama Student Chapter of the AVMA during the second semester of the 1949-1950 school year were Curtis R. Fincher, president-elect; Tom S. Maddox, president; Ned C. Prickett, vice-president; Charlie J. Ogletree, secretary; John W. Dantzler, treasurer; and Dr. W. J. Gibbons, faculty advisor. Class representatives were Spencer McMaster, senior; Russel Laster, junior; Howard Acree, sophomore, Bob Mullins, freshman.

At the Feb. 21, 1950, meeting, the film "The Horse and Its Heritage in Tennessee" was shown. Another film "Ye Olde and the New in Medical Research" was shown at the meeting on March 7. March 28 and April 11 meetings were given over to chapter business. On April 25, Dr. Charlie Williams, Rome, Ga., spoke on "Problems and Cases of General Practice." Dr. K. M. Autrey, head, Dairy Husbandry Department spoke, on May 9, about the "Food Value of Milk." The film "Free and Easy" was shown.

On May 23, the following officers were installed to serve during the coming semester: T. Abner Hawkins, president-elect; James E. Neal, vice-president; Wilfred R. Harper, secretary; William R. Ross, treasurer; Jennings Bozeman, senior representative; Jack Courtney, junior representative; William Fairey, sophomore representative; and Dr. W. J. Gibbons, faculty advisor.

The annual social event was a barbecue at Chewacla State Park on May 6, with about 600 members and guests in attendance.

s/CHARLIE J. OGLETREE, *Secretary.*

• • •

Iowa State Chapter.—The following officers served for the second term of the 1949-1950 school year: G. E. Schoel, president; W. Fennessy, president-elect; G. N. Lukas, vice-president; D. K. Thorpe, secretary; R. J. Peglow, critic; M. L. Miller, treasurer; Dr. Dwight Smith, faculty advisor. Class representatives were L. L. Bates, senior; M. M. Vanderloo, junior; N. Chapin, sophomore, and R. Anthony, freshman.

A summary of second semester activities follows: Dr. S. F. Scheidy, veterinary research director for Sharp and Dohme, presented a paper at the March 8 meeting on "New Trends in Veterinary Therapy." On March 29, Mr. M. O. Cullen, director of the Department of Meat Merchandising of the National Livestock and Meat Board, discussed "Meat Cutting" (with illustrations). Dr. H. U. Garrett, chief, Iowa State Division of Animal Industry, on April 12, spoke on the relations and obligations of the practicing veterinarian to the Division and the ways in which that office can aid the veterinarian. At the meeting on May 17, Dr. D. A. Smith, Department of Medicine, who is faculty advisor to the Chapter, introduced the winners of the Moss Essay contest—J. Cowles, first place; K. Giese, second place; and R. Searl, third. A. R. Ram was selected as student representative to the AVMA convention in Miami Beach.

Officers elected for the first term of the next year are J. Bricker, president-elect; K. Faber, vice-president; N. Y. Chung, secretary; L. Jenson, critic; L. Cavanaugh, treasurer; and Dr. O. Whitcomb, faculty advisor. Class representatives are F. F. Densmore, senior; R. Phillips, junior; and D. H. Wheeler, sophomore.

The students of the veterinary division again put on a dog exhibit show during Veishea festivities. There were more than 70 breeds of dogs represented. The Division won second place honors among the floats in the Veishea parade. Sam Holman, float chairman, presented the trophy won by the float to the Chapter at the May 17 meeting.

In the all-college election, R. P. Bendorf was elected to serve on Cardinal Guild and R. Stamy was elected to the publications board of the *Iowa State Daily*. W. Danker was appointed program chairman for the chapter meetings next year.

R. T. Speaker, L. C. Allenstein, and D. M. Anderson, all members of the graduating class, are new members of the Phi Kappa Phi Honor Society.

s/DARYL K. THORPE, *Retiring Secretary.*

WOMEN'S AUXILIARY

Mrs. Anthony E. Bott, Chairman, Foreign Relations.—Through the committee on Foreign Relations of the Auxiliary to the AVMA, many foreign countries have been contacted during this past year. Wives of veterinarians in several European countries, including Scandinavia, South American countries, and the Philippines were guided in their work of organizing into auxiliaries. They have appreciated this help and are grateful to us.

After the International Veterinary Congress held in London last summer, Mrs. A. E. Bott, chairman of the Foreign Relations committee, met seven representatives from other countries. They were eager to know more about the objectives and aims of the Women's Auxiliary to the AVMA, and returned to their respective countries with information which they hoped to use locally.

While in London, Mrs. Bott spoke before the Ladies Guild Victorian Veterinary Benevolent group, which is the auxiliary to the National

Veterinary Association (British), and is made up of women from Wales, Scotland, Ireland, and England. During this session a plan was proposed to contact the wives, daughters, and mothers of veterinarians in all countries where there are national veterinary medical associations. At this meeting, Mrs. Bott was asked

Mrs. Anthony E. Bott

to act as president of this newborn organization (the International Women's Auxiliary), and four other women were elected to serve as vice-presidents and to contact women in interested countries. Since this meeting, 28 countries have been contacted and served through the international board. These developments are reported here because they were, in the beginning, somewhat inspired by the Foreign Relations committee of the Women's Auxiliary to the AVMA.

As a part of the activities of the chairman and the members of the Foreign Relations committee of the Women's Auxiliary to the AVMA, many friendly and worthwhile contacts have been made.

• • •

Students Receiving the Auxiliary Award for 1950.—Mr. Robert C. Bay, Colorado A. & M. College, was selected to receive the Women's Auxiliary Award ($25) presented to the student making a special contribution which advanced the standing of the veterinary college on the campus. Mr. Bay was chosen because of his activity in college affairs, both in the veterinary college and in the institution as a whole. He served as business manager of the "Silver Spruce" (college yearbook) for two years; is a member of Alpha Psi and Phi Kappa Phi, scholastic fraternities, and appears in "Who's Who in American Universities."

Mr. Jean-Marie Blais, University of Montreal, was chosen to receive the Women's Auxiliary Award because of his contribution to the students association of which he was the president. He is responsible for the creation of a student chapter at the school, and also its affiliation as a junior chapter of the AVMA.

Mr. Desmond Hill, University of Toronto, was the recipient of the Women's Auxiliary Award for his interest and active participation in college activities. Mr. Hill is a popular member of his class and was president of the Agriculture and Veterinary Council. He is gifted in dramatics and was on the first class honor list.

The faculty committee of the School of Veterinary Medicine, University of Pennsylvania, gave the Women's Auxiliary Award to Mr. James Albert Himes. Mr. Himes was an outstanding student in every way.

The faculty of the College of Veterinary Medicine, State College of Washington, chose Mr. Fred J. Wedam to receive the Women's Auxiliary Award.

s/FLORENCE MILLER, *President.*

• • •

Georgia Auxiliary.—The entertainment program, June 26-27, of the Women's Auxiliary to the Georgia Veterinary Medical Association included a social hour, coke party, association luncheon, and sight-seeing trips to Golden Isles, St. Simon, and Jekyl Island.

• • •

Michiana Auxiliary.—The Women's Auxiliary to the Michiana Veterinary Medical Association met at the Hotel Rumley, LaPorte, Ind., June 8, 1950. Mrs. C. A. Miller, secretary of the national association, spoke to the group, and Mrs. Harry Fry, Michigan City, Ind., told of her hobby of collecting baskets from all over the world.

• • •

North Dakota Auxiliary.—The Women's Auxiliary to the North Dakota Veterinary Medical Association met in the Brandenburg home in Bismarck on June 4-6, 1950. On the entertainment program was brunch, sight-seeing, shopping, the banquet, and a trip to Garrison Dam. New officers of the association are Mrs. F. Bolin, Fargo, president; Mrs. C. H. Hofstrand, Leeds, vice-president; Mrs. J. F. Hinz, Lidgerwood, secretary-treasurer.

s/MRS. J. F. LIDGERWOOD, *Secretary.*

• • •

Texas Auxiliary.—At the meeting of the Women's Auxiliary to the State Veterinary Medical Association of Texas on June 8-9, there were 73 members present. A new constitution and by-laws were adopted and a gift of $50 was made to the library fund of the veterinary college. A history and roster of membership is being prepared for publication. Twenty-seven new members were added at this meeting.

New officers are Mrs. J. L. Rogers, Jr., Fort Worth, president; Mrs. J. O. Whitehead, Houston,

vice-president; Mrs. Chas. D. Folse, Kemah, secretary-treasurer; Mrs. L. G. Cloud, Fort Worth, delegate to the Miami Beach meeting; and Mrs. U. E. Marney, San Antonio, alternate.

s/(MRS. C. D.) BELLE S. FOLSE, *Retiring Secretary.*

U. S. GOVERNMENT

Regular Corps Examination, U.S.P.H.S.—A competitive examination for appointment of veterinarians to the Regular Corps of the U. S. Public Health Service will be held Oct. 9-11, 1950, at a number of points throughout the United States. Applications received after Sept. 11, 1950, will not be accepted.

The Regular Corps is a commissioned officer corps composed of members of the various medical and scientific professions. Appointments will be made in the grades of assistant veterinarian (first lieutenant rank) and senior assistant veterinarian (captain). Appointments are permanent in nature and provide opportunities for qualified veterinarians for a life career in research, pathology, and in the veterinary aspect of public health, field investigation, and food sanitation. The names of applicants who successfully complete the examination will be placed on a merit roll, from which appointments will be made to fill current and future vacancies.

Both grades require the applicant to be a citizen of the United States, at least 21 years of age, and a graduate of an accredited college of veterinary medicine. Applicants for assistant veterinarian must have at least seven years of educational training and professional experience subsequent to high school. Senior assistants must have at least ten years of educational training and professional experience subsequent to high school. Applicants who complete these requirements within nine months of the date of the written examination will be admitted, but may not be appointed until they meet these requirements. The examination will include an oral interview, physical examination, and written objective tests covering the professional field.

For further information write Dr. J. Howard Beard, senior surgeon, chief, Recruitment and Commissions Branch, Division of Commissioned Officers, Public Health Service, Washington 25, D. C.

s/J. HOWARD BEARD, *Senior Surgeon.*

APPLICATIONS

The listing of applicants conforms to the requirements of the administrative by-laws—Article X.

First Listing

ALEXANDER, EDGAR P.
102 W. 4th St., Villisca, Iowa.
D.V.M., Iowa State College, 1945.
Voucher: F. B. Young.

ALL, ALBERT
Andes, N.Y.
D.V.M., New York State Veterinary College, 1937.
Voucher: J. J. Regan.

BAILEY, EARL G., JR.
Box 148, Dexter, Mo.
D.V.M., Texas A. & M. College, 1943.
Voucher: J. L. Wells.

BAKER, PAUL K.
1500 N. Kansas St., Hastings, Neb.
D.V.M., Kansas State College, 1917.
Voucher: O. Geisler.

BAXTER, EARLE G.
65 E. Main St., Webster, N.Y.
D.V.M., Michigan State College, 1919.
Voucher: J. J. Regan.

BIXBY, DONALD O.
Norfolk, N.Y.
D.V.M., New York State Veterinary College, 1935.
Voucher: J. J. Regan.

BROWN, ALBERT L.
R.D. 1, Adams, N.Y.
D.V.M., New York State Veterinary College, 1915.
Voucher: J. J. Regan.

BROWNING, OSCAR H.
Box 308, Dickinson, N. Dak.
D.V.M., Texas A. & M. College, 1949.
Voucher: T. O. Brandenburg.

BURCH, GEORGE E.
West Winfield, N.Y.
D.V.M., New York State Veterinary College, 1936.
Voucher: J. J. Regan.

BURKEY, MAJOR FRED M., USAF, V.C.
Station Hosp., Ladd AF Base, Fairbanks, Alaska.
D.V.M., Texas A. & M. College, 1931.
Vouchers: R. R. Miller and W. O. Kester.

CASSEL, HAROLD K.
Bethlehem Pike, Souderton, Pa.
V.M.D., University of Pennsylvania, 1944.
Voucher: R. C. Snyder.

CUNNINGHAM, CAPT. GEORGE N., USAF, V.C.
314th Med. Base Unit, Sewart A.F.B., Smyrna, Tenn.
D.V.M., Chicago Veterinary College, 1918.
Vouchers: R. R. Miller and W. O. Kester.

DICKE, WALTER E.
301 Price Ave., Harrisonville, Mo.
D.V.M., Kansas State College, 1934.
Voucher: J. L. Wells.

FERRIS, JOSEPH
Holcomb, N.Y.
D.V.M., New York State Vet. College, 1941.
Voucher: J. J. Regan.

FIELDER, JOE J.
Rt. 2, Box 34, Beaverdam, Va.
D.V.M., Michigan State College, 1949.
Voucher: H. K. Royer.

FLATER, GUY N.

1591 N. Cherry, Galesburg, Ill.
D.V.M., Iowa State College, 1949.
Voucher: A. G. Misener.

FREY, CHARLES J.
8109 Georgia Ave., Silver Spring, Md.
D.V.S., U. S. College of Veterinary Surgeons, 1906.
Voucher: C. H. Thompson, Jr.

GEORGE, E. C.
Garrattsville, N. Y.
D.V.M., New York State Veterinary College, 1933.
Voucher: J. J. Regan.

GORFIEN, HARRY
c/o Commission Mexico-Americana, Apartado Postal 751, Vallarta No. 1, Mexico, D.F.
D.V.M., Ecole Nationale Vétérinaire, D'Alfort, 1949.
Vouchers: W. Kaplan and M. S. Verplank.

GUMP, ROBERT H.
6701 E. Kellogg, Wichita 15, Kan.
D.V.M., Kansas State College, 1933.
Voucher: O. W. Morris.

HOUSLEY, ALBERT H.
Rt. 1, Hwy. 7, Hot Springs, Ark.
D.V.M., Chicago Veterinary College, 1915.
Voucher: J. A. Pulliam.

HUTT, SAMUEL
2121 E. 29th St., Brooklyn 29, N.Y.
D.V.M., New York State Veterinary College, 1935.
Voucher: J. J. Regan.

JACKSON, GILBERT S.
2126 N. Marengo, Altadena, Calif.
D.V.M., Iowa State College, 1943.
Voucher: C. S. Travers.

JEROME, NEWELL G.
433 S. Division St., Blytheville, Ark.
D.V.M., Alabama Polytechnic Institute, 1941.
Voucher: J. A. Pulliam.

KECK, WILLIAM C.
2150 Union Blvd., S.E., Grand Rapids, Mich.
D.V.M., Michigan State College, 1917.
Voucher: B. J. Killham.

KYNER, MAJOR ROY E., USAF, V.C.
Humeston, Iowa
D.V.M., Iowa State College, 1941.
Voucher: R. R. Miller and W. O. Kester.

LANTIS, CHARLES W.
822 Hampshire, Quincy, Ill.
D.V.M., McKillip Veterinary College, 1918.
Voucher: A. G. Misener.

LOOPE, CLARENCE L.
26 Fenner St., Cazenovia, N.Y.
D.V.M., New York State Veterinary College, 1922.
Voucher: J. J. Regan.

MIESSE, WILLIAM B.
2196 Central Ave., Memphis, Tenn.
D.V.M., Kansas State College, 1943.
Voucher: H. W. Nance.

MINSTER, JOHN C.
20 Lake Ave., Glens Falls, N.Y.
D.V.M., New York State Veterinary College, 1932.
Voucher: J. J. Regan.

MOHR, EARL S.
4264 W. Capitol St., Jackson, Miss.
D.V.M., Indiana Veterinary College, 1914.
Voucher: J. A. Randle.

NAYLOR, HOWARD W.
Morris, N.Y.
D.V.M., New York State Veterinary College, 1913.
Voucher: J. J. Regan.

NEUBERT, SIEGFRIED T.
101 Forest Pk. Blvd., Lufkin, Texas.
D.V.M., Texas A. & M. College, 1940.
Voucher: E. A. Grist.

PENNY, STANLEY G.
105 Prospect Pk. W., Brooklyn, N.Y.
D.V.M., New York State Veterinary College, 1935.
Voucher: J. J. Regan.

PIERCE, FOSTER H.
Ipswich, S. Dak.
D.V.S., Kansas City Veterinary College, 1909.
Voucher: R. M. Scott.

PIERCE, RAY J.
Crown Point, N.Y.
D.V.M., New York State Veterinary College, 1935.
Voucher: J. J. Regan.

PRICE, WILLET J.
Wisner, Neb.
D.V.M., Kansas State College, 1931.
Voucher: O. Geisler.

PULVER, DONALD W.
R.F.D., Phelps, N.Y.
D.V.M., New York State Veterinary College, 1935.
Voucher: J. J. Regan.

RUGGER, FRED E.
Oxford, Iowa.
B.V.Sc., Ontario Veterinary College, 1914.
Voucher: F. B. Young.

RODGERS, L. D.
Box 301, Greenwood, S. Car.
D.V.M., Alabama Polytechnic Inst., 1944.
Voucher: R. A. Mays.

SCHAEFER, GEORGE L.
1210 "H" St., Tekamah, Neb.
D.V.M., Kansas City Veterinary College, 1913.
Voucher: O. Geisler.

SCHOTT, FRANCIS J.
Box 55, Nacogdoches, Texas.
D.V.M., Texas A. & M. College, 1937.
Voucher: E. A. Grist.

SEARS, KIRTLEY
508 N. Buchanan St., Maryville, Mo.
D.V.M., St. Joseph Veterinary College, 1923.
Voucher: J. L. Wells.

SHIVES, LEO S.

Hancock, Md.
D.V.M., Ohio State University, 1935.
Voucher: J. W. Hastings, Sr.

SIGRIST, JENNINGS B.
446 Federal Bldg., Salt Lake City, Utah.
D.V.M., St. Joseph Veterinary College, 1923.
Voucher: E. A. Tugaw.

STARNS, HOWARD
Humboldt, Neb.
D.V.S., St. Joseph Veterinary College, 1911.
Voucher: O. Geisler.

SUTORIUS, JOHANNE A.
Fairway W., Sayville, N.Y.
D.V.M., New York State Veterinary College, 1929.
Voucher: J. J. Regan.

THOMSON, VALE U.
Clearfield, Iowa.
D.V.M., Iowa State College, 1938.
Voucher: F. B. Young.

WAY, ROBERT D.
Creston, Ohio.
D.V.M., Ohio State University, 1939.
Voucher: F. J. Kingma.

WEAVER, LONNIE H.
230 E. Oakview, San Antonio 9, Tex.
D.V.M., Texas A. & M. College, 1939.
Voucher: E. A. Grist.

WYNKOOP, GARRETT
1024 1st Ave., Fargo, N. Dak.
V.M.D., University of Pennsylvania, 1912.
Voucher: T. O. Brandenburg.

Second Listing

ALSON, M. C., 120 Howard St., Carthage, Mo.
ALSTROM, INGEMAN E., Royal Veterinary College, Stockholm, Sweden.
BIDDLE, GLEN, 206 W. Butler St., Bryan, Ohio.
BODENHEIMER, JOSEPH G., Freeburn, Ky.
BOUTON, ALTON P., Box 242, Saranac Lake, N.Y.
BOYD, WILLIAM I., 526 Locust Pl., Sewickley, Pa.
BROWN, J. H., 276 W. Market St., Marietta, Pa.
CARLISLE, WILLIAM M., Washington Ave., Hickory, Pa.
COLE, EDWARD J., 40 Prospect St., Pawtucket, R.I.
DAVIS, KENNETH G., 508 N. Alder, Aberdeen, Wash.
FIESER, JOHN E., Clearwater, Kan.
GLASS, HARRY M., 229 E. 60th St., New York 22, N.Y.
GOLDWASSER, HARRY I., 56-12 Roosevelt Ave., Woodside, L.I., N.Y.
GOMUTPUTRA, CHOOMPHORN, International Center, Michigan State College, East Lansing, Mich.
HEIGES, N. D., 109 Main St., Russellville, Ky.
HURD, JOHN M., Box 287, Schleswig, Iowa.
JESSEN, BORGE, Forum, Guldager, Denmark.
KELLY, PATRICK J., 19233 James Couzens Hwy., Detroit 35, Mich.
KITCHEN, ROBERT H., R.D. 4, New Castle, Pa.
KULP, HENRY W., Box 127, Lansdale, Pa.
LEE, DANA H., N. Main St., Lancaster, N. H.
MCNAY, GARRETT H., Leon, Iowa.
MARKS, WARREN R., Emmetsburg, Iowa.
MARTIN, JOHN E., 53 Beverly Ave., East Lansdowne, Pa.
MENDLOWSKI, B., P.O. Box 186, Ada, Minn.
MILLER, GEORGE G., JR., 1321 S. Broadway, Denver 10, Colo.
MILLER, HERBERT E., 1801 S. Bayshore Lane, Miami 33, Fla.
MITAT, JUAN A., Animas #453, altos, Havana, Cuba.
MORKIS, EDWARD S., 111 N. Pearl St., Brockton 55, Mass.
MURPHY, C. F., Buda, Ill.
NELSON, WILLIAM Q., Inwood, Iowa.
O'CONNELL, HARRY J., 6 West, State Capitol, Madison 2, Wis.
PAIGE, CHESTER A., P.O. Box 1026, Lee St. Ext., Alexandria, La.
PAIGE, ROSS S., P.O. Box 1026, Lee St. Ext., Alexandria, La.
REECE, CHESTER L., 103 S. 1st St., Savannah, Mo.
ROBINSON, JACK E., Clayton, Del.
STRAIN, CLARENCE B., Dunkerton, Iowa.
TERRY, JOHN W., 68 N. Village Ave., Rockville Centre, L.I., N.Y.
THOMAS, JOSEPH A., 34 Lander St., Newburgh, N.Y.
WALKER, ASA L., P.O. Box 1232, Jackson, Tenn.

1950 Graduate Applicants

First Listing

The following are graduates who have recently received their veterinary degree and who have applied for AVMA membership under the provision granted in the Administrative By-Laws to members in good standing of junior chapters. Applications from this year's senior classes not received in time for listing this month will appear in later issues. An asterisk (*) after the name of a school indicates that all of this year's graduates have made application for membership.

Alabama Polytechnic Institute

ALLEN, BERT R., JR., D.V.M.
Rt. 2, Box 122, Okmulgee, Okla.
Vouchers: W. J. Gibbons and J. F. Hokanson.

ALLEN, THOMAS L., D.V.M.
769 Vance Ave., Memphis 5, Tenn.
Vouchers: W. J. Gibbons and J. A. McBee.

AUSTIN, BILLY S., D.V.M.
McDonough, Ga.
Vouchers: A. M. Wiggins and J. A. McBee.

BLAKE, WILTON E., D.V.M.
1911 Ardsley Pl., Tampa, Fla.
Vouchers: J. A. McBee and W. J. Gibbons.

BOZEMAN, WILLIAM F., D.V.M.
Adel, Ga.
Vouchers: B. F. Hoerlein and W. N. Konde.

Burgess, Walter H., D.V.M.
Stewart's Vet. Hosp., Cullman, Ala.
Vouchers: W. N. Konde and J. E. Greene.

Carraway, Bennette L., D.V.M.
Weldon, N. Car.
Vouchers: L. O. Llewellyn and W. J. Gibbons.

Clements, William W., D.V.M.
Crossville, Tenn.
Vouchers: L. O. Llewellyn and J. F. Hokanson.

Davis, Aaron M., D.V.M.
Rt. 4, Box 745, Tallahassee, Fla.
Vouchers: J. A. McBee and D. S. Folse.

Driscoll, Victor H., D.V.M.
P.O. Box 551, Wharton, Tex.
Vouchers: J. A. McBee and L. O. Llewellyn.

Faust, J. P., D.V.M.
Ozark, Ala.
Vouchers: B. F. Hoerlein and W. N. Konde.

Field, Charles W., D.V.M.
P.O. Box 622, Phenix City, Ala.
Vouchers: J. E. Greene and B. F. Hoerlein.

Foreman, Max M., D.V.M.
Coffee Animal Clinic, La Center, Ky.
Vouchers: G. F. Hokanson and W. J. Gibbons.

Goodell, Charles B., D.V.M.
2087 Piedmont Rd., N.E., Atlanta, Ga.
Vouchers: B. F. Hoerlein and W. J. Gibbons.

Hazard, Mark G., Jr., D.V.M.
West Point, Miss.
Vouchers: J. E. Greene and W. N. Konde.

Hunter, Orello F., D.V.M.
LaFayette, Ala.
Vouchers: A. A. Leibold and J. F. Hokanson.

Jennings, Karon R., D.V.M.
McMinnville, Tenn.
Vouchers: R. S. Sugg and L. O. Llewellyn.

Kelly, James S., D.V.M.
107 Water St., Bristol, Va.
Vouchers: R. S. Sugg and L. O. Llewellyn.

Kidder, Clarence W., D.V.M.
P.O. Box 476, Belle Glade, Fla.
Vouchers: R. S. Sugg and J. G. Hardenbergh.

Lang, Charles V., Jr., D.V.M.
Amory, Miss.
Vouchers: L. O. Llewellyn and B. F. Hoerlein.

Lowman, Cecil B., D.V.M.
1531 Caldwell St., Newberry, S. Car.
Vouchers: J. A. McBee and D. S. Folse.

McMaster, Spencer R., D.V.M.
149 E. Black St., Rock Hill, S. Car.
Vouchers: L. O. Llewellyn and W. J. Gibbons.

Madbox, Tom S., D.V.M.
N. Cherry St., Greenville, Ky.
Vouchers: A. M. Wiggins and W. J. Gibbons.

Mann, Richard C., D.V.M.
507 E. Lincoln St., Tullahoma, Tenn.
Vouchers: L. O. Llewellyn and J. F. Hokanson.

Miller, Thomas M., D.V.M.
Dothan, Ala.
Vouchers: D. S. Folse and W. N. Konde.

Miller, William R., D.V.M.
R.F.D., Robertsdale, Ala.
Vouchers: L. O. Llewellyn and R. S. Sugg.

Monroe, Willard P., D.V.M.
P.O. Box 444, Vicksburg, Miss.
Vouchers: W. J. Gibbons and C. S. Roberts.

Newberne, James W., D.V.M.
1600 N. Plum St., Hutchinson, Kan.
Vouchers: J. A. McBee and W. N. Konde.

Newberne, Paul M., D.V.M.
Apt. 3, 422 W. Magnolia, Auburn, Ala.
Vouchers: T. C. Fitzgerald and A. M. Wiggins.

O'Neal, Francis B., D.V.M.
320 N. 12th St., Gadsden, Ala.
Vouchers: L. O. Llewellyn and R. S. Sugg.

Parmer, Dan G., D.V.M.
1050 Jordan St., Shreveport, La.
Vouchers: W. J. Gibbons and N. D. Connor.

Patterson, George W., D.V.M.
Bainbridge, Ga.
Vouchers: L. O. Llewellyn and A. M. Wiggins.

Peeler, Hoyt E., D.V.M.
817 Edger Ave., Effingham, Ill.
Vouchers: A. M. Wiggins and L. O. Llewellyn.

Pilgreen, Clyde E., Jr., D.V.M.
2702 Perham Ave., Selma, Ala.
Vouchers: A. M. Wiggins and J. F. Hokanson.

Plummer, William E., D.V.M.
Goldsboro, N. Car.
Vouchers: J. F. Hokanson and C. S. Roberts.

Prickett, Ned C., D.V.M.
Oneonta, Ala.
Vouchers: R. S. Sugg and J. G. Hardenbergh.

Reid, Alfred F., Jr., D.V.M.
200 Morgan St., Tampa, Fla.
Vouchers: W. J. Gibbons and A. M. Wiggins.

Richardson, Lewis E., D.V.M.
404 N. Cleveland Ave., Albany, Ga.
Vouchers: A. M. Wiggins and J. F. Hokanson.

Rosumny, Benjamin F., Jr., D.V.M.
7 Mastin Dr., Montgomery, Ala.
Vouchers: J. A. McBee and I. S. McAdory.

Staples, William D., Jr., D.V.M.
c/o Box 453, Arkadelphia, Ark.
Vouchers: W. J. Gibbons and R. S. Sugg.

Schmitz, Joseph A., D.V.M.
Box 1698, Auburn, Ala.
Vouchers: R. S. Sugg and L. O. Llewellyn.

Stone, David C., D.V.M.
320 N. 12th St., Gadsden, Ala.
Vouchers: R. S. Sugg and J. E. Greene.

Stuart, Ernest D., D.V.M.
Cleveland Pk. Vet. Hosp., Box 992,
Greenville, S. Car.
Vouchers: J. F. Hokanson and L. O. Llewellyn.

Swafford, Kenneth L., D.V.M.
Hartselle, Ala.
Vouchers: J. F. Hokanson and B. F. Hoerlein.

TAYLOR, WINFORD L., D.V.M.
Arab, Ala.
Vouchers: A. M. Wiggins and R. S. Sugg.

WHEELER, GRADIE J., D.V.M.
c/o Almance Vet. Hosp., Burlington, N. Car.
Vouchers: J. F. Hokanson and W. J. Gibbons.

WILLIAMS, RALPH J., D.V.M.
Lebanon, Tenn.
Vouchers: L. O. Llewellyn and W. J. Gibbons.

WINKLER, HOWARD W., JR., D.V.M.
Philadelphia, Miss.
Vouchers: L. O. Llewellyn and R. S. Sugg.

WISE, FRENCH P., D.V.M.
Gen. Del., Greensboro, N. Car.
Vouchers: L. O. Llewellyn and W. J. Gibbons.

Colorado A. & M. College

AANES, WILBUR A., D.V.M.
Rt. 1, Box 116, Fort Collins, Colo.
Vouchers: J. Farquharson and L. C. Moss.

ANDIS, CLARK G., D.V.M.
Presho, S. Dak.
Vouchers: L. C. Moss and A. W. Deem.

ANNIS, JOHN R., D.V.M.
3854 Federal Blvd., Denver, Colo.
Vouchers: J. Farquharson and R. Jensen.

BAILEY, DONALD E., D.V.M.
Rt. 1, Upper Lake, Lake County, Calif.
Vouchers: E. C. Morris and L. C. Moss.

BAILEY, FREDERIC L., D.V.M.
P.O. Box 1223, Tucson, Ariz.
Vouchers: R. W. Davis and G. P. Epling.

BECKLEY, JAMES C., D.V.M.
5313 Wisconsin Ave., N.W., Washington 15, D.C.
Vouchers: A. W. Deem and R. W. Davis.

BEERY, RAY W., D.V.M.
c/o William P. Johnson, Slater, Mo.
Vouchers: R. H. Jourdan and A. W. Deem.

BEST, LLOYD G., D.V.M.
820 West Mt. Ave., Ft. Collins, Colo.
Vouchers: A. W. Deem and F. K. Bracken.

BOICE, EDWIN D., D.V.M.
Box 75, Romeo, Colo.
Vouchers: H. J. Hill and A. W. Deem.

BROWN, WILLIS A., D.V.M.
1520 S. College, Ft. Collins, Colo.
Vouchers: L. C. Moss and R. W. Davis.

BRYANT, WALTER E., D.V.M.
1918 Bank St., Bakersfield, Calif.
Vouchers: F. K. Bracken and E. L. Nye.

CARNES, ALLEN R., D.V.M.
218 Spruce St., Trinidad, Colo.
Vouchers: L. C. Moss and J. Farquharson.

CLINE, EARL R., D.V.M.
1020 Spring St., Lewistown, Mont.
Vouchers: F. K. Bracken and M. M. Benjamin.

CONDON, WALTER F., D.V.M.
1802 S. 35th Ave., Phoenix, Ariz.
Vouchers: M. M. Benjamin and D. D. Delahanty.

COOK, HENRY H., D.V.M.
161 W. Mountain Ave., Fort Collins, Colo.
Vouchers: L. C. Moss and R. H. Jourdan.

CRAWFORD, JAMES H., D.V.M.
6620 W. 35th Ave., Wheat Ridge, Colo.
Vouchers: M. M. Benjamin and F. Cross.

DELLI QUADRI, CLARENCE A., D.V.M.
1101 E. Routt, Pueblo, Colo.
Vouchers: M. M. Benjamin and R. Jensen.

DOROTHY, OLIVER D., D.V.M.
1403 Fern St., San Diego, Calif.
Vouchers: A. W. Deem and R. W. Davis.

DOUGLAS, JACK D., D.V.M.
Bay City, Ore.
Vouchers: J. Farquharson and L. C. Moss.

EMERSON, JOHN K., D.V.M.
Las Animas, Colo.
Vouchers: L. C. Moss and L. K. Wayt.

FARMER, THEODORE A., D.V.M.
Broken Bow, Neb.
Vouchers: R. Jensen and F. K. Bracken.

GIAMBRONI, ANDREW F., D.V.M.
Box 782, Red Bluff, Calif.
Vouchers: F. Cross and R. Jensen.

GOUCHENOUR, CECIL F., D.V.M.
3233 W. Florence Ave., Los Angeles, Calif.
Vouchers: A. W. Deem and R. Jensen.

GRIFFITH, CHET R., D.V.M.
8821 Aurora, Seattle 3, Wash.
Vouchers: F. Cross and A. W. Deem.

HAMILTON, GEORGE A., D.V.M.
664 N. Michigan Ave., c/o E. C. Hamilton, Chicago 11, Ill.
Vouchers: R. D. Frandson and L. C. Moss.

ICKES, MILLARD W., D.V.M.
Rt. 5, Nampa, Idaho.
Vouchers: A. W. Deem and F. Cross.

KENNEDY, ROBERT W., D.V.M.
Concord, N. Car.
Vouchers: R. H. Jourdan and M. M. Benjamin.

KNOWLES, KALPH C., D.V.M.
Rt. 1, Box 30, Golden, Colo.
Vouchers: R. S. Jackson and L. C. Moss.

KONISHI, BENJAMIN, D.V.M.
Rt. 2, Box 25, Platteville, Colo.
Vouchers: L. C. Moss and R. H. Jourdan.

LYONS, DANIEL J., D.V.M.
2010 Columbus, Ottawa, Ill.
Vouchers: L. C. Moss and G. P. Epling.

MCMILLIN, JAMES C., D.V.M.
Gen. Del., Buhl, Idaho.
Vouchers: J. Farquharson and L. C. Moss.

MANNING, JAMES I., D.V.M.
Meeker, Colo.
Vouchers: H. P. Scott and F. Cross.

MURPHY, GEORGE L., D.V.M.
500 Willow Lane, Kirkwood, Mo.
Vouchers: W. M. Hindman and R. H. Jourdan.

MURRAY, GEORGE H., D.V.M.
1044 Lake, Pueblo, Colo.
Vouchers: L. A. Griner and R. Jensen.

OLMSTEAD, EDWARD P., D.V.M.
c/o National Park Service, West Glacier, Mont.
Vouchers: A. W. Deem and F. K. Bracken.

PETERSEN, FREDERICK W., D.V.M.
Avoca, Iowa.
Vouchers: F. K. Bracken and M. M. Benjamin.

PITCHER, JAMES C., D.V.M.
Walden, Colo.
Vouchers: L. C. Moss and M. M. Benjamin.

RAMSDALE, PHILIP N., D.V.M.
1008 W. 11th St., San Pedro, Calif.
Vouchers: L. C. Moss and A. W. Deem.

RICE, BURT H., D.V.M.
533 Forest, Reno, Nev.
Vouchers: A. W. Deem and A. A. Goodman.

ROPA, HOWARD M., D.V.M.
330 S.W. 4th St., Ontario, Ore.
Vouchers: H. G. Hill and A. A. Goodman.

ROSS, HERMAN, D.V.M.
1123 2nd Ave., W., Kalispell, Mont.
Vouchers: F. K. Bracken and L. A. Griner.

SCHROEDER, HERMAN D., D.V.M.
Carr, Colo.
Vouchers: O. R. Adams and D. D. Delahanty.

SORGEN, VICTOR I., D.V.M.
800 S. Colorado Blvd., Denver, Colo.
Vouchers: O. R. Adams and R. Jensen.

STAHMANN, BENJAMIN R., D.V.M.
2566 Orchard Ave., Ogden, Utah.
Vouchers: F. Cross and H. J. Hill.

VINSON, JOHN C., D.V.M.
Box 72, Sweet Home, Ore.
Vouchers: R. H. Jourdan and L. C. Moss.

WINKLER, JOHN K., D.V.M.
217 N. Elmwood Dr., Aurora, Ill.
Vouchers: M. M. Benjamin and L. A. Griner.

YUNKER, CHARLES W., D.V.M.
1509 S. Main St., Aberdeen, S. Dak.
Vouchers: D. D. Delahanty and H. J. Hill.

University of Georgia

All of the following applicants, with the exception of those otherwise noted, were vouchered by T. J. Jones and P. L. Piercy.

BRYSON, JAMES T., D.V.M.
Washington, Ga.

CHRISTOPHER, JOHN L., D.V.M.
S. Poplar St., Lincolnton, N. Car.

COOK, WALTER G., D.V.M.
Clarkesville, Ga.

DARBYSHIRE, QUINCY L., D.V.M.
Moultrie, Ga.

DAVIS, CALVIN M., D.V.M.
Wrightsville, Ga.

DODGEN, OLLIE M., D.V.M.
Cove St., Calhoun, Ga.

DORMINY, ARTHUR L., D.V.M.
Enigma, Ga.

DRAKE, ROSCOE L., D.V.M.
Collins, Ga.

DUCEY, FREDERICK E., JR., D.V.M.
Ridgeland, S. Car.

DYE, ORE D., JR., D.V.M.
1225 W. Broad St., Gainesville, Ga.

FISHER, JAMES H., D.V.M.
Clayton, Ga.

GRINER, ERNEST R., D.V.M.
1039 Marietta St., N.W., Atlanta, Ga.

HENRY, GAYNOR W., D.V.M.
P.O. Box 692, Athens, Ga.

HERRING, JOHN G., JR., D.V.M.
P.O. Box 811, Thomasville, N. Car.

HIGHTOWER, DEWARD E., D.V.M.
W. Jefferson, N. Car.

HILLIARD, BYRON F., D.V.M.
Bowersville, Ga.

LEARD, LECIL T., D.V.M.
Box 253, Hartwell, Ga.

LOTT, ROBERT L., D.V.M.
Winder, Ga.

MCCONNELL, EDWARD L., D.V.M.
P.O. Box 378, Clarkesville, Ga.

MCDONALD, PAUL A., D.V.M.
Fitzgerald, Ga.
Vouchers: C. P. Hill and W. A. MacKenzie.

MCNEILL, CHARLES N., D.V.M.
Box 298, Ag. Campus, Athens, Ga.

MERCER, JOHN T., D.V.M.
Box 537, Ag. Campus, Athens, Ga.

MOBLEY, RALPH C., D.V.M.
Rossville Veterinary Clinic, Rossville, Ga.

PALMER, JACK R., D.V.M.
1363 S. Milledge, Athens, Ga.

PHILLIPS, HARLEY A., D.V.M.
Jesup, Ga.

REAGAN, CLYDE M., D.V.M.
Box 541, Ag. Campus, Athens, Ga.

SHANNON, ROBERT O., D.V.M.
922 N. Emory St., Covington, Ga.

SMITH, FELIX M., D.V.M.
12th Ave., Cordele, Ga.

SMITH, WILLIAM V., D.V.M.
Rt. 152, Box 628, Jacksonville, Fla.

TAYLOR, DAWSON L., D.V.M.
303 W. Main, Manchester, Ga.

THOMAS, JOHN B., D.V.M.
Eatonton, Ga.

THOMAS, WALTER G., D.V.M.
Calvary, Ga.

TUTTLE, JACK G., D.V.M.
Barnesville, Ga.

WATSON, WILLIAM H., JR., D.V.M.
Warner Robins, Ga.

WINCEY, CHARLES W., D.V.M.
1601 N. Mills St., Orlando, Fla.

Iowa State College

ALBRECHT, DUANE T., D.V.M.
1000 Cove Way, Denver, Colo.
Vouchers: C. H. Covault and M. W. Sloss.

BUNGE, LELAND F., D.V.M.
16 N. 7th St., Estherville, Iowa.
Vouchers: C. H. Covault and I. A. Merchant.

CLARK, FORREST R., D.V.M.
555 Pammel Ct., Ames, Iowa.
Vouchers: M. A. Emmerson and I. A. Merchant.

COOPER, ALFRED W., D.V.M.
Seymour, Iowa.
Voucher: C. H. Covault and I. A. Merchant.

DAPPEN, ROBERT R., D.V.M.
Manning, Iowa.
Vouchers: R. A. Packer and H. J. Ruebke.

EDENBURN, JOHN J., D.V.M.
918 Pammel Ct., Ames, Iowa.
Vouchers: G. R. Fowler and I. A. Merchant.

FELDMAN, ROGER G., D.V.M.
Box 241, Wapello, Iowa.
Vouchers: D. A. Smith and C. H. Covault.

FLYNN, THOMAS J., D.V.M.
Kimballton, Iowa.
Vouchers: E. A. Benbrook and D. A. Smith.

FULLER, DONALD A., D.V.M.
Eldridge, Iowa.
Vouchers: F. K. Ramsey and C. H. Covault.

GIESE, KEITH M., D.V.M.
Carroll, Iowa.
Vouchers: D. A. Smith and I. A. Merchant.

GUBSER, DARWIN E., D.V.M.
Earlham, Iowa.
Vouchers: I. A. Merchant and D. A. Smith.

HULL, SPENCER G., D.V.M.
What Cheer, Iowa.
Vouchers: L. M. Jones and F. K. Ramsey.

MELCHER, JOHN D., D.V.M.
Forsyth, Mont.
Vouchers: I. A. Merchant and R. A. Packer.

MOORE, ROBERT A., D.V.M.
Dunlap, Iowa.
Vouchers: F. K. Ramsey and W. A. Greene.

POOL, MAX G., D.V.M.
725 York Ave., York, Neb.
Vouchers: D. A. Smith and C. H. Covault.

RANDOLPH, KENNETH H., D.V.M.
Lost Nation, Iowa.
Vouchers: H. L. Foust and R. O. Rydell.

SEVERSON, RONALD E., D.V.M.
Moorhead, Iowa.
Vouchers: D. A. Smith and W. H. Chivers.

URRATSCH, ROBERT W., D.V.M.
120 S. Washington, Albert Lea, Minn.
Vouchers: I. A. Merchant and D. A. Smith.

Michigan State College*

BEACH, ROBERT C., D.V.M.
105 S. Oakland St., St. Johns, Mich.
Vouchers: H. W. Dunne and R. G. Schirmer.

BENNETT, GEORGE N., D.V.M.
De Smet, S. Dak.
Vouchers: G. R. Moore and L. B. Sholl.

BISWAL, GANESWAR, D.V.M.
304 Phillips Hall, Michigan State College, East Lansing, Mich.
Vouchers: F. E. Eads and R. G. Schirmer.

BLOOMQUIST, DONALD E., D.V.M.
906 Davis St., Kalamazoo, Mich.
Vouchers: W. O. Brinker and R. G. Schirmer.

BRITT, ALFRED L., D.V.M.
Bourbon, Ind.
Vouchers: H. W. Dunne and E. A. White.

BROWN, ROGER E., D.V.M.
726 Clark St., Lansing, Mich.
Vouchers: G. R. Moore and A. R. Drury.

COLE, CHARLES H., D.V.M.
2865 Schust Rd., Saginaw, Mich.
Vouchers: L. B. Sholl and R. G. Schirmer.

CRENSHAW, GEORGE L., D.V.M.
632 S. Maple St., Escondido, Calif.
Vouchers: R. D. Barner and C. S. Bryan.

DAY, MCCLURE, D.V.M.
Damariscotta, Maine.
Vouchers: R. G. Langham and C. S. Bryan.

DEHN, ALBERT C., D.V.M.
Unity, Wis.
Vouchers: C. S. Bryan and B. J. Killham.

DIAMANT, GERALD, D.V.M.
101 N. Sycamore St., Lansing, Mich.
Vouchers: G. W. Reed and B. J. Killham.

DORNBOS, WILLARD A., D.V.M.
232 John Ball Park Dr., S. W., Grand Rapids, Mich.
Vouchers: E. K. Sales and B. J. Killham.

DOYLE, THOMAS O., D.V.M.
Minnesota Lake, Minn.
Vouchers: E. K. Sales and J. D. Hutton.

DUNLAP, JACK S., D.V.M.
College of Vet. Med., State College of Washington, Pullman, Wash.
Vouchers: R. G. Schirmer and P. A. Hawkins.

FLORA, STANLEY H., D.V.M.
Durand, Wis.
Vouchers: E. K. Sales and R. G. Schirmer.

FULLER, WILLIAM J., D.V.M.
Rt. 5, Box 524, Battle Creek, Mich.
Vouchers: R. G. Schirmer and F. E. Eads.

GEIGER, HAROLD N., D.V.M.
Croswell, Mich.
Vouchers: G. R. Moore and L. B. Sholl.

GESSERT, ROLAND A., D.V.M.
332 E. Wattles Rd., Rt. 4, Birmingham, Mich.
Vouchers: E. K. Sales and W. O. Brinker.

GOODALE, RICHARD H., D.V.M.
413 A. Hawthorne Lane, East Lansing, Mich.
Vouchers: C. S. Bryan and A. R. Drury.

GRAY, DONALD E., D.V.M.
1902 Commonwealth, Kalamazoo, Mich.
Vouchers: W. F. Riley, Jr., and C. F. Clark.

GRAY, JACK E., D.V.M.
813 Birch Rd., East Lansing, Mich.
Vouchers: R. D. Barner and E. A. White.

GUNN, CHARLES W., D.V.M.
Fort Wayne, Ind.
Vouchers: C. F. Clark and E. K. Sales.

GURNEAU, CHARLES J., D.V.M.
2813 21st St., Racine, Wis.
Vouchers: G. R. Moore and J. P. Hutton.

HAFNER, ROBERT M., D.V.M.
Woodburn, Ind.
Vouchers: C. S. Bryan and F. Thorp, Jr.

HANSON, ARTHUR L., D.V.M.
Aurora, Neb.
Vouchers: A. R. Drury and F. E. Eads.

HANSON, LEROY E., D.V.M.
818 Chestnut St., Apt. D, East Lansing, Mich.
Vouchers: C. S. Bryan and F. E. Eads.

HANSON, LYLE E., D.V.M.
5730 Dogwood Pl., Crestwood, Madison 5, Wis.
Vouchers: R. F. Langham and B. J. Killham.

HARTRICK, LYLE A., D.V.M.
1610 Richton Ave., Detroit, Mich.
Vouchers: J. P. Hutton and E. K. Sales.

HAWLEY, GAIL E., D.V.M.
3345 Briggs Blvd., N.E., Grand Rapids, Mich.
Vouchers: R. G. Schirmer and C. S. Bryan.

HEGENAUER, WILLIAM, JR., D.V.M.
435 S. Washington, Saginaw, Mich.
Vouchers: C. S. Bryan and E. K. Sales.

HENEVELD, GEORGE, JR., D.V.M.
7420 W. Michigan Ave., Kalamazoo, Mich.
Vouchers: C. S. Bryan and C. F. Clark.

HIGGINS, MARTIN L., D.V.M.
2145 Grace St., Chicago, Ill.
Vouchers: R. G. Schirmer and C. S. Bryan.

JOHNSON, WERNER J., D.V.M.
916-D Maple Lane, East Lansing, Mich.
Vouchers: C. S. Bryan and A. R. Drury.

JOHNSTON, WILLIAM R., D.V.M.
89 E. Chicago St., Quincy, Mich.
Vouchers: R. D. Barner and C. S. Bryan.

KLEIN, HAROLD M., D.V.M.
36 Melrose St., Boston, Mass.
Vouchers: F. W. Young and A. R. Drury.

KNIPPLING, FRANCIS D., D.V.M.
128 Durand St., East Lansing, Mich.
Vouchers: W. F. Riley Jr. and J. P. Hutton.

LAMSER, ROBERT D., D.V.M.
Rt. 1, Petoskey, Mich.
Vouchers: C. F. Clark and E. K. Sales.

LARSON, CHARLES H., D.V.M.
Oak St., Earlville, Ill.
Vouchers: R. G. Schirmer and F. E. Eads.

LEE, ROBERT E., JR., D.V.M.
Williamston, Mich.
Vouchers: R. D. Drury and R. D. Barner.

LINDSAY, STAFFORD A., JR., D.V.M.
2338 Charles St., Rockford, Ill.
Vouchers: C. S. Bryan and E. K. Sales.

LINTON, GEORGE A., D.V.M.
661 E. Olive St., Long Beach, L. I., N. Y.
Vouchers: C. F. Clark and C. S. Bryan.

LIVINGSTON, MORTON L., D.V.M.
Rt. 1, Hartford, Mich.
Vouchers: E. K. Sales and R. G. Schirmer.

MCWADE, DONALD H., D.V.M.
443 W. State St., Cheboygan, Mich.
Vouchers: F. E. Eads and E. A. White.

MITCHELL, M. DONALD, D.V.M.
Shepherd, Mich.
Vouchers: A. R. Drury and C. S. Bryan.

MOTT, THOMAS, A., D.V.M.
118 N. Main St., Leslie, Mich.
Vouchers: A. R. Drury and C. S. Bryan.

OJA, EDWIN, D.V.M.
155 Leroy St., Ferndale, Mich.
Vouchers: C. S. Bryan and E. K. Sales.

PATTON, WILLIAM H., D.V.M.
18 Wendt Ave., Larchmont, N. Y.
Vouchers: A. R. Drury and G. R. Moore.

PETREE, HERBERT C., D.V.M.
Rt. 1, Okemos, Mich.
Vouchers: C. S. Bryan and H. W. Dunne.

PHILLIPS, RUSSELL M., D.V.M.
92 Maple St., Winchendon, Mass.
Vouchers: R. G. Schirmer and C. S. Bryan.

RANN, RICHARD A., D.V.M.
320 W. Harris Ave., Charlotte, Mich.
Vouchers: E. K. Sales and W. O. Brinker.

ROBINETTE, BURKE A., D.V.M.
3142 Four Mile Rd., N.E., Grand Rapids 5, Mich.
Vouchers: W. O. Brinker and A. R. Drury.

SCHMIDT, LAURENCE E., D.V.M.
Coopersville, Mich.
Vouchers: L. B. Sholl and C. S. Bryan.

SMITH, ALBERT W., JR., D.V.M.
Farmville, N. Car.
Vouchers: C. S. Bryan and C. F. Clark.

SOLAC, RAYMOND B., D.V.M.
2100 Fourth St., N.E., Minneapolis, Minn.
Vouchers: E. K. Sales and C. S. Bryan.

SPAULDING, CLARK E., D.V.M.
603 Burnside St., Caro, Mich.
Vouchers: C. F. Clark and L. B. Sholl.

SWARTS, ROBERT J., D.V.M.
Rt. 1, Sturgis, Mich.
Vouchers: W. O. Brinker and E. K. Sales.

SWONDER, JAY E., D.V.M.
1317 Parrett St., Evansville, Ind.
Vouchers: E. K. Sales and F. E. Eads.

TAYLOR, RAY L., D.V.M.
R.F.D. 1, La Fayette, Ind.
Vouchers: F. W. Young and C. S. Bryan.

VAN AKEN, WARNER B., D.V.M.
Kirklin, Ind.
Vouchers: C. S. Bryan and L. B. Sholl.

WEBB, GEORGE E., D.V.M.
Calhoun City, Miss.
Vouchers: E. K. Sales and C. S. Bryan.

WEBER, CHARLES H., D.V.M.
1316 Stone St., Port Huron, Mich.
Vouchers: W. O. Brinker and F. E. Eads.

WHITEHEAD, GEORGE L., D.V.M.
3309 Gratiot Ave., Port Huron, Mich.
Vouchers: C. F. Clark and L. B. Sholl.

WHYTE, GEORGE S., D.V.M.
2226 E. Main St., Kalamazoo, Mich.
Vouchers: R. D. Barner and B. J. Killham.

WILLIAMS, JAMES A., D.V.M.
419 D Hawthorn St., East Lansing, Mich.
Vouchers: W. F. Riley, Jr. and E. A. White.

WILLIAMSON, J. D., D.V.M.
R.F.D. 2, Curryville, Mo.
Vouchers: E. A. White and F. W. Young.

YOUN, BYUNG H., D.V.M.
10 Chung Jung-no 1st St., West Gate Ward, Seoul, Korea.
Vouchers: C. S. Bryan and R. F. Langham.

YOUNG, JAMES R., D.V.M.
1363 Yorkshire Rd., Grosse Pointe Pk., Mich.
Vouchers: F. W. Young and E. K. Sales.

University of Missouri*

BRAINARD, WARREN D., D.V.M.
5219 Leighton Ave., Lincoln, Neb.
Vouchers: H. H. Berrier and O. S. Crisler.

COLEY, FLOYD E., D.V.M.
814 Sixth St., Booneville, Mo.
Vouchers: A. H. Groth and O. S. Crisler.

CONRAD, MARSHALL D., D.V.M.
Polo, Mo.
Vouchers: S. Smith and O. S. Crisler.

CRENSHAW, WESLEY W., D.V.M.
c/o George V. Geiger, R.F.D. 3, Booneville, Mo.
Vouchers: R. Moody and A. W. Uren.

ECKHOFF, HAROLD C., D.V.M.
102 E. Ray St., Sweet Springs, Mo.
Vouchers: O. S. Crisler and S. C. Benbrook.

EVANS, JAMES H., JR., D.V.M.
1521 Clay St., St. Charles, Mo.
Vouchers: A. H. Groth and O. S. Crisler.

FARRELL, JAMES K., D.V.M.
1029 S. Williams, Moberly, Mo.
Vouchers: O. S. Crisler and S. Smith.

HARTLEY, JESSE L., D.V.M.
1213 St. Louis St., Springfield, Mo.
Vouchers: H. H. Berrier and O. S. Crisler.

HUGHES, JOSEPH C., D.V.M.
Middletown, Mo.
Vouchers: O. S. Crisler and S. Smith.

JONES, ROBERT P., D.V.M.
R.R. 4, St. Joseph, Mo.
Vouchers: R. Moody and A. W. Uren.

KNAPPENBERGER, GEORGE E., D.V.M.
908 Commercial St., Atchison, Kan.
Vouchers: A. H. Groth and J. G. Hardenbergh.

KRAUTMANN, EDMUND J., D.V.M.
909 E. Elm St., Columbia, Mo.
Vouchers: R. Moody and O. S. Crisler.

LEDGERWOOD, RAY D., D.V.M.
West Plains, Mo.
Vouchers: O. S. Crisler and A. A. Case.

MCCREA, JAMES C., D.V.M.
109 W. 29th, Topeka, Kan.
Vouchers: O. S. Crisler and R. Moody.

MCKEE, GERALD L., D.V.M.
Maryville, Mo.
Vouchers: O. S. Crisler and A. A. Case.

MILLER, MAURICE, D.V.M.
Carrollton, Mo.
Vouchers: O. S. Crisler and A. H. Groth.

MINOR, WILLIAM J., D.V.M.
5620 E. 16th St., Kansas City 3, Mo.
Vouchers: J. E. Weinman and H. H. Berrier.

PILCHER, HAROLD W., D.V.M.
R.R. 2, Gilman City, Mo.
Vouchers: O. S. Crisler and A. H. Groth.

POWELL, ELMER B., JR., D.V.M.
7739 Kingsbury Blvd., Clayton, Mo.
Vouchers: A. H. Groth and H. H. Berrier.

SCHILB, WARREN C., D.V.M.
3927 N.W. 9th St., Oklahoma City, Okla.
Vouchers: O. S. Crisler and J. E. Weinman.

SCHONDELMEYER, WILLIAM L., D.V.M.
116 E. Maple, Independence, Mo.
Vouchers: H. H. Berrier and A. H. Groth.

SEELBACH, JAMES R., D.V.M.
R.F.D. 1, Browns Station, Mo.
Vouchers: O. S. Crisler and A. H. Groth.

SIMPSON, JOHN B., D.V.M.
310 Main St., Fayette, Mo.
Vouchers: H. H. Berrier and O. S. Crisler.

THOM, PAUL H., D.V.M.
North Bend, Neb.
Vouchers: H. H. Berrier and O. S. Crisler.

WILLS, THOMAS D., JR., D.V.M.
Oak Ridge, Mo.
Vouchers: O. S. Crisler and A. H. Groth.

ZOLLMAN, PAUL E., D.V.M.
R.F.D. 4, Macon, Mo.
Vouchers: A. H. Groth and J. E. Weinman.

New York State Veterinary College*

ADSIT, MILTON E., D.V.M.
114 Summit Ave., Ithaca, N.Y.
Vouchers: H. C. Stephenson and F. H. Fox.

ALDRICH, STANLEY M., D.V.M.
Huntington, N.Y.
Vouchers: H. L. Gilman and H. C. Stephenson.

BEAKMAN, LAVERNE M., D.V.M.
c/o J. B. Skelton, Box 2, Boston Post Rd., Riverside, Conn.
Vouchers: H. C. Stephenson and E. P. Leonard.

CRISPELL, DONALD H., D.V.M.
Slaterville Springs, N.Y.
Vouchers: M. G. Fincher and H. C. Stephenson.

DEUTSCH, HENRY J., D.V.M.
4027 Bedford Ave., Brooklyn 29, N.Y.
Vouchers: K. McEntee and L. Z. Saunders.

FUECHSEL, ROBERT E., D.V.M.
127 College Ave., Ithaca, N.Y.
Vouchers: M. G. Fincher and F. H. Fox.

GARRISON, STANLEY E., D.V.M.
R.D. 1, Ballston Lake, N.Y.
Vouchers: W. A. Hagan and A. M. Mills.

GAY, WILLIAM I., D.V.M.
136-21 Hillside Ave., Jamaica, N.Y.
Vouchers: H. C. Stephenson and F. H. Fox.

GROGAN, JOSEPH W., D.V.M.
508 S. Aurora St., Ithaca, N.Y.
Vouchers: A. M. Mills and H. C. Stephenson.

HAENEL, WILLIAM F., D.V.M.
Rt. 1, Fredonia, N.Y.
Vouchers: M. G. Fincher and H. C. Stephenson.

HAMMOND, JAMES F., D.V.M.
R.D. 1, Dansville, N.Y.
Vouchers: H. C. Stephenson and A. M. Mills.

HANNIGAN, DANIEL J., D.V.M.
1499 Plimpton Ave., New York, N.Y.
Vouchers: S. J. Roberts and H. C. Stephenson.

HARRIS, ROBERT J., D.V.M.
688 Tower Rd., Ithaca, N.Y.
Vouchers: A. M. Mills and H. C. Stephenson.

HIXON, ALVIN E., D.V.M.
131 Mary St., Daytona Beach, Fla.
Vouchers: H. C. Stephenson and F. H. Fox.

HOLZWORTH, JEAN, D.V.M.
353 Westchester Ave., Port Chester, N.Y.
Vouchers: S. D. Johnson and P. Olafson.

JONES, EUGENE M., D.V.M.
5302 E. 11th., Tulsa, Okla.
Vouchers: H. C. Stephenson and F. H. Fox.

JONES, STUART V., D.V.M.
Box 324, Norwich, N.Y.
Vouchers: S. J. Roberts and H. G. Hodges.

LAMBERT, RONALD D., D.V.M.
78 W. 3rd St., Bayonne, N.J.
Vouchers: H. C. Stephenson and F. H. Fox.

LAWRENCE, GEORGE E., D.V.M.
Rocky Mount, Va.
Vouchers: I. Stern and H. C. Stephenson.

LEWIS, ANSON C., D.V.M.
R.D. 2, Pine City, N.Y.
Vouchers: S. J. Roberts and H. C. Stephenson.

LOOMIS, VADER M., D.V.M.
R.F.D., Mannsville, N.Y.
Vouchers: H. H. Dukes and H. C. Stephenson.

MARKHAM, CLARON E., D.V.M.
Turin, N.Y.
Vouchers: M. G. Fincher and H. C. Stephenson.

MCCARTHY, GERALD E., D.V.M.
Portville, N.Y.
Vouchers: A. M. Mills and H. C. Stephenson.

MCKENNA, VINCENT E., D.V.M.
2956 Bainbridge Ave., New York 58, N.Y.
Vouchers: H. C. Stephenson and E. P. Leonard.

MILLER, WILSON L., D.V.M.
642 Tower Rd., Ithaca, N.Y.
Vouchers: J. W. Kendrick and R. F. Birchard.

MORRIS, ROBERT G., D.V.M.
R.D. 1, Montour Falls, N.Y.
Vouchers: H. C. Stephenson and F. H. Fox.

OSTRANDER, JOHN P., D.V.M.
36 Lockrow Blvd., Albany 5, N.Y.
Vouchers: A. M. Mills and F. H. Fox.

PADGET, PAUL W., D.V.M.
741 Tower Rd., Ithaca, N.Y.
Vouchers: H. C. Stephenson and F. H. Fox.

PALMER, LYNN G., D.V.M.
R.D. 2, Carthage, N.Y.
Vouchers: H. L. Gilman and H. C. Stephenson.

PECKHAM, MALCOLM C., D.V.M.
190 S. Walker St., Taunton, Mass.
Vouchers: H. J. Milks and H. C. Stephenson.

PHILLIPS, SEELEY M., D.V.M.
Congers Rd., New York, N.Y.
Vouchers: C. G. Rickard and H. C. Stephenson.

PULEO, JOSEPH, D.V.M.
212 S. Hill Terrace, Ithaca, N.Y.
Vouchers: J. H. Whitlock and J. M. Murphy.

RAEMSCH, ROBERT P., D.V.M.
147 E. Seneca Turnpike, Syracuse, N.Y.
Vouchers: H. C. Stephenson and F. H. Fox.

RICH, JOHN W., D.V.M.
683 E. Tower Rd., Ithaca, N.Y.
Vouchers: H. C. Stephenson and E. P. Leonard.

ROCKWELL, STEWART R., D.V.M.
R.D. 2, Ithaca, N.Y.
Vouchers: H. C. Stephenson and F. H. Fox.

ROSS, SIMEON L., D.V.M.
404 Eddy St., Ithaca, N.Y.
Vouchers: R. E. Habel and H. H. Dukes.

SCHMIDT, MILTON, JR., D.V.M.
506 E. Veterans Place, Ithaca, N.Y.
Vouchers: H. C. Stephenson and F. H. Fox.

SEVERSON, ALFRED O., D.V.M.
516 Main St., Detroit Lakes, Minn.
Vouchers: M. G. Fincher and P. Olafson.

SICKLES, WALTER J., D.V.M.
Etna, N.Y.
Vouchers: E. P. Leonard and H. C. Stephenson.

SIEGRIST, JACOB C., D.V.M.
1813 E. 29th St., Baltimore, Md.
Vouchers: H. C. Stephenson and F. H. Fox.

SIMON, HAROLD F., D.V.M.
R.D. 3, East Syracuse, N.Y.
Vouchers: A. M. Mills and H. C. Stephenson.

SIMON, NORMAN, D.V.M.
c/o Ezersky, 285 St. John's Pl., Brooklyn, N.Y.
Vouchers: H. C. Stephenson and F. H. Fox.

STACK, ROBERT J., D.V.M.
1421 Bellevue Ave., Syracuse, N.Y.
Vouchers: A. M. Mills and H. J. Milks.

SZLACHTA, HENRY L., D.V.M.
Paris, N.Y.
Vouchers: R. W. Dougherty and F. H. Fox.
TUTHILL, DALLAS B., D.V.M.
396 Saw Mill River Rd., Hawthorne, N.Y.
Vouchers: K. McEntee and M. E. Miller.
UHLENDORF, ALBERT H., D.V.M.
112-08 212 St., St. Albans 11, N.Y.
Vouchers: J. W. Kendrick and H. C. Stephenson.
VAN AKEN, JOHN L., D.V.M.
27 Phillips St., Amsterdam, N.Y.
Vouchers: A. M. Mills and H. C. Stephenson.
WICKS, GEORGE W., JR., D.V.M.
8 Oakwood Terrace, New Paltz, N.Y.
Vouchers: M. G. Fincher and H. C. Stephenson.
ZIMMERMAN, MANUEL, D.V.M.
412 West End Ave., New York 24, N.Y.
Vouchers: P. Olafson and J. Bentinck-Smith.

Ohio State University

LOUFMAN, LUKE L., D.V.M.
R.D. 1, Elyria, Ohio.
Vouchers: C. D. Diesem and W. G. Loufman.

Ontario Veterinary College

ANDERSON, ALISTER R., D.V.M.
Vermilion, Alta.
Vouchers: T. L. Jones and A. F. Bain.
AVERY, ROBERT J., D.V.M.
114 Stanley Ave., Ottawa, Ont.
Vouchers: T. L. Jones and L. T. Smith.
COOPER, HAROLD W., D.V.M.
Forest, Ont.
Vouchers: L. T. Smith and A. F. Bain.
CONNELL, MURRAY C., D.V.M.
Forest, Ont.
Vouchers: L. T. Smith and A. F. Bain.
GAY, ROBERT K., D.V.M.
490 E. Cuyahoga Falls Ave., Akron 10, Ohio.
Vouchers: H. P. Noonan and T. L. Jones.
GOULD, LAWRENCE G., D.V.M.
747 Pavey St., Woodstock, Ont.
Vouchers: J. H. Ballantyne and L. T. Smith.
HARRISON, GEORGE E., D.V.M.
Aylmer, Ont.
Vouchers: J. H. Ballantyne and L. T. Smith.
MAPLESDEN, DOUGLAS C., D.V.M.
Seaforth, Ont.
Vouchers: J. O. Turnbull and T. L. Jones.
MARTIN, WILLIAM M., D.V.M.
Drayton, Ont.
Vouchers: T. L. Jones and L. T. Smith.
MITCHELL, ROSS A., D.V.M.
392 Durie St., Toronto, Ont.
Vouchers: W. J. Rumney and C. L. McGilvray.
MURRAY, LORNE G., D.V.M.
177 Oxford St., Ingersoll, Ont.
Vouchers: J. A. Henderson and T. L. Jones.
PARK, ARCHIBALD B., D.V.M.
Rondeau Provincial Pk., R.R. 1, Morpeth, Ont.
Vouchers: T. L. Jones and L. C. Swan.
RABJOHN, ALLAN B., D.V.M.
7 Fergus St., N., Guelph, Ont.
Vouchers: L. T. Smith and F. J. Cote.
RIPLEY, WINFIELD A., D.V.M.
Richmond Hill, Ont.
Vouchers: L. C. Swan and T. L. Jones.
ROBERTSON, ALEXANDER, D.V.M.
Dept. of Agri., Victoria, B.C.
Vouchers: T. L. Jones and A. F. Bain.
ROBINSON, JAMES I., D.V.M.
85A Oxford St., Guelph, Ont.
Vouchers: F. J. Cote and T. L. Jones.
SHILLINGLAW, JAMES H., D.V.M.
Kingsdale, P.O., Ont.
Vouchers: T. L. Jones and A. F. Bain.
WARREN, KENNETH, D.V.M.
Killarney, Man.
Vouchers: F. J. Cote and T. L. Jones.

University of Pennsylvania

All of the following applicants with the exception of those otherwise noted, were vouchered by R. A. Kelser and J. D. Beck.

AMES, SHERMAN, V.M.D.
129 Spring Garden St., Easton, Pa.
BARBER, ELLSWORTH E., V.M.D.
Tioga Co., Mansfield, Pa.
BATHKE, FREDERIC H., JR., V.M.D.
403 S. 40th St., Philadelphia 4, Pa.
BISCOTTE, NICHOLAS J., V.M.D.
c/o Bedford General Hosp., Bedford, Va.
BODIE, LEON M., JR., V.M.D.
833 Anthracite Ave., Kingston, Pa.
BOGGS, FRANK J., V.M.D.
R.D. 7, Box 374, Greensburg, Pa.
BULL, WILBUR S., V.M.D.
R.F.D. 2, Watertown, N.Y.
BRAGDON, GEORGE W. B., V.M.D.
641 Lowell St., Methuen, Mass.
DICKINSON, OTHO D., V.M.D.
207 E. Moody St., New Castle, Pa.
Vouchers: R. A. Kelser and D. K. Detweiler.
GNADE, RENE, C., V.M.D.
540 W. 123 St., New York 27, N.Y.
GRUEN, A. ARNOLD, V.M.D.
2902 B. Pierce Dr., Philadelphia 45, Pa.
Vouchers: D. K. Detweiler and J. D. Beck.
HENRY, ROBERT T., JR., V.M.D.
724 W. Broad St., Quakertown, Pa.
HIMES, JAMES A., V.M.D.
Box 271, Shelbyville, Tenn.
KAMSLER, DONALD C., V.M.D.
104 Jericho Manor, Jenkintown, Pa.
LEIBOVITZ, LOUIS, V.M.D.
4251 Girard Ave., Philadelphia 4, Pa.
MACKENSEN, RICHARD S., V.M.D.
Yardley, Pa.
MAGURA, PAUL, V.M.D.
217 Messinger St., Johnstown, Pa.
MATTHEWS, THOMAS J., V.M.D.
454 Stuyvesant Ave., Irvington, N.J.
MICKISH, ALBERT J., V.M.D.
c/o Mrs. J. J. Zavodny, Red Rock, Okla.

Miller, Graham M., V.M.D.
926 Seventh Ave., Bethlehem, Pa.
Moist, Kenneth F., V.M.D.
c/o Dr. R. D. Hoffman, 325 S. Richard St., Bedford, Pa.
Newsham, Richard C., V.M.D.
607 Third Ave., Audubon, N.J.
Palkovitz, Myer Z., V.M.D.
551 Shaw Ave., McKeesport, Pa.
Parente, John J., V.M.D.
700 N. Vine St., Hazleton, Pa.
Vouchers: R. C. Snyder and R. A. Kelser.
Peck, Arthur H., V.M.D.
434 N. 34th St., Philadelphia, Pa.
Rabin, Paul H., V.M.D.
4830 N. 7th St., Philadelphia 20, Pa.
Schultz, Harry L., Jr., V.M.D.
1926 E. 31st St., Baltimore 18, Md.
Shoemaker, Thomas W., V.M.D.
312 Wyoming Ave., Wyoming, Pa.
Simmons, Leonard B., V.M.D.
1602 S. 8th St., Philadelphia 48, Pa.
Stevens, Frederick H., V.M.D.
307 Walnut St., Manchester, N.H.
Stolte, George L., V.M.D.
1020 Gillmore St., Philadelphia 24, Pa.
Stowe, Clarence M., Jr., V.M.D.
Div. of Vet. Med., University Farm, U. of Minn., St. Paul 1, Minn.
Vouchers: C. I. Boyer, Jr., and H. N. Blumner, Jr.
Strattan, Sanford R., V.M.D.
509 W. Fifth St., Lewistown, Pa.
Taylor, Lawrence H., V.M.D.
40 Mercer Ave., Sharpsville, Pa.
Vouchers: W. B. Boucher and R. A. Kelser.
Taylor, Woodrow W., V.M.D.
1200 Peachtree Blvd., Richmond 23, Va.
Wills, Franklin K., V.M.D.
R.D. 1, Bristol, Pa.

State College of Washington

Binkley, Kenneth L., D.V.M.
2227 4th Ave., S., Seattle, Wash.
Vouchers: E. C. Stone and D. R. Cordy.
Boddy, Allan J., D.V.M.
Rankin Vet. Hosp., 2360 Fairground Rd., Salem, Ore.
Vouchers: D. R. Cordy and E. E. Wegner.
Bone, Jesse F., D.V.M.
3718 N. 30th St., Tacoma 7, Wash.
Vouchers: J. R. Gorham and E. E. Wegner.
Brimble, Robert P., D.V.M.
Ronan, Mont.
Vouchers: E. E. Wegner and J. G. Hardenbergh.
Child, Stanton M., D.V.M.
12101 Iredell St., North Hollywood, Calif.
Vouchers: E. E. Wegner and D. R. Cordy.
Coleman, Charles H., D.V.M.
64 E. Buffalo, Chandler, Ariz.
Vouchers: H. E. Adler and E. E. Wegner.
Engel, Elbon E., D.V.M.
North Water St., Rt. 3, Ellensburg, Wash.
Vouchers: E. C. Stone and H. E. Adler.
Erwin, James D., D.V.M.
Box 241-V, Alta Hill, Grass Valley, Calif.
Vouchers: H. E. Adler and E. E. Wegner.
Fuller, Jay R., D.V.M.
321 Wellington Ave., Walla Walla, Wash.
Vouchers: E. E. Wegner and P. A. Klavano.
Garner, Floris M., D.V.M.
5302 N. 20th St., Phoenix, Ariz.
Vouchers: E. E. Wegner and D. R. Cordy.
Gates, Sheridan D., D.V.M.
Lewiston, Mont.
Vouchers: D. R. Cordy and E. E. Wegner.
Greenlaw, John W., Jr., D.V.M.
Rt. 7, Box 314, Tacoma, Wash.
Vouchers: E. E. Wegner and H. E. Adler.
Gustafson, William H., D.V.M.
1520 B St., Marysville, Calif.
Vouchers: D. R. Cordy and R. L. Ott.
Hewitt, Henry C., D.V.M.
129 Talbot Ave., Santa Rosa, Calif.
Vouchers: H. E. Adler and E. E. Wegner.
Hilton, Harold A., D.V.M.
Box 122, Steilacoom, Wash.
Vouchers: H. E. Adler and E. E. Wegner.
Holtzheimer, Don H., D.V.M.
4320 6th N.E., Seattle, Wash.
Vouchers: R. L. Ott and E. E. Wegner.
Keatts, Berger, D.V.M.
Pomeroy, Wash.
Vouchers: E. C. Stone and E. E. Wegner.
Keely, Carl E., D.V.M.
Rupert, Idaho.
Vouchers: E. E. Wegner and H. E. Adler.
King, James R., D.V.M.
Star Route, Suquamish, Wash.
Vouchers: J. R. Gorham and E. E. Wegner.
Law, Raymond M., D.V.M.
Box 241 V, Alta Hill, Grass Valley, Calif.
Vouchers: J. R. Gorham and E. E. Wegner.
Low, David L., D.V.M.
R.D. 1, Box 1110, Ventura, Calif.
Vouchers: E. E. Wegner and H. E. Adler.
Lyons, James P., D.V.M.
5408 N. Washington St., Spokane, Wash.
Vouchers: H. E. Adler and E. E. Wegner.
Miller, Jay H., D.V.M.
502 30th Ave., Seattle 22, Wash.
Vouchers: J. A. McCurdy and E. E. Wegner.
Peckenpaugh, Charles I., D.V.M.
407 Auburn Ave., Auburn, Wash.
Vouchers: D. R. Cordy and E. E. Wegner.
Reynolds, Guy E., D.V.M.
Rt. 3, East Chicago St., Caldwell, Idaho.
Vouchers: J. R. Gorham and L. R. Montgomery.
Russell, Robert A., D.V.M.
2012 E. 80th St., Seattle 5, Wash.
Vouchers: E. E. Wegner and P. A. Klavano.
Thue, George M., D.V.M.
2635 W. 88th St., Seattle 7, Wash.
Vouchers: E. E. Wegner and R. L. Ott.

WEBB, HOMER B., D.V.M.
42-C S. Fairway, Pullman, Wash.
Vouchers: L. R. Montgomery and E. E. Wegner.
WEIBEL, JOHN L., D.V.M.
233 St. Helen's Ave., Tacoma 3, Wash.
Vouchers: E. E. Wegner and J. R. Gorham.
WILSON, GREGG H., D.V.M.
Gen. Del., College Station, Pullman, Wash.
Vouchers: E. E. Wegner and J. R. Gorham.

Second Listing

Ohio State University

ARDERY, DAVID H., D.V.M., R.R. 4, Greensburg, Ind.
BEAR, GEORGE T., D.V.M., 855 Center St., Ashland, Ohio.
BECHDOLT, WILLIAM E., D.V.M., Rockford, Ohio.
BLUE, JAMES G., D.V.M., R.R. 1, Flora, Ind.
BORST, LAWRENCE M., JR., D.V.M., 3224 Lincoln Way W., South Bend, Ind.
BROWN, ROBERT L., D.V.M., Box 1051, Staunton, Va.
BUCKLEY, EDWARD K., D.V.M., 527 E. Washington St., Lisbon, Ohio.
BUSCH, CARL J., D.V.M., R.D. 3, Canton, Ohio.
CARR, WILLIAM S., D.V.M., Lebanon, Ohio.
CARR, WOODROW W., D.V.M., 185 Miller Ave., Apt. 4, Columbus 5, Ohio.
CLINGER, PHILIP C., D.V.M., Rt. 1, Rochester, Ind.
CRILL, DAVISON E., D.V.M., 2939 Woodhill Rd., Cleveland 4, Ohio.
CURTIS, JESSE C., JR., D.V.M., R.R. 1, Kenton, Ohio.
CUSTIS, ROBERT J., D.V.M., Main St., New Vienna, Ohio.
DEAL, HAL R., D.V.M., Milton Junction, Wis.
DIEHL, JAMES R., D.V.M., c/o Dr. L. P. Bailey, Piqua, Ohio.
DOUDNA, JACK M., D.V.M., Santa Rosa, Fla.
EARLY, DAVID O., D.V.M., Mishicot, Wis.
EDGAR, WILLIAM C., D.V.M., c/o Dr. L. A. Burkey, Sugarcreek, Ohio.
ENDRIZZI, NICK, D.V.M., Spencer, W. Va.
ENSIGN, ROBERT S., D.V.M., Mishicot, Wis.
EVERSOLE, WILLIAM H., D.V.M., 427 N. Main St., New Carlisle, Ohio.
FARRELL, ROBERT L., D.V.M., 2596 Clermont Dr., Apt. D, Columbus 10, Ohio.
GEUE, EDWARD A., D.V.M., Rt. 2, Snohomish, Wash.
GREGG, JACK H., D.V.M., 2802 Sherwood Rd., Columbus, Ohio.
GUNNING, LEROY G., D.V.M., c/o Badger & Vaupel Vet. Med. Hosp., Rt. 54 N., Kankakee, Ill.
HAGELY, JAMES M., D.V.M., 495 Piedmont Rd., Columbus, Ohio.
HAY, WILLIAM L., D.V.M., 458 McPheron Ave., Lima, Ohio.
HEADLEY, HOWARD G., D.V.M., 756 S. Chesterfield Rd., Columbus 9, Ohio.
HOFACKER, HENRY J., D.V.M., 518 Jackson St., Charleston, Ill.
HOUSER, ROBERT G., D.V.M., c/o Dr. S. K. Andreassen, Menomonie, Wis.
JONES, JAMES E., D.V.M., 66 N. Burgess Ave., Columbus 4, Ohio.
KENNEDY, EDWARD J., D.V.M., Miamiville, Ohio.
KLEPINGER, NOLAN W., D.V.M., Spencer, Wis.
LIES, JOHN S., D.V.M., Ft. Recovery, Ohio.
LUCKETT, JOSEPH C., D.V.M., 5600 Olentange River Rd., Worthington, Ohio.
LYMAN, JOHN, JR., D.V.M., 23204 Chardon Rd., Euclid 17, Ohio.
MACINNIS, GORDON A., D.V.M., 645 Quinby Ave., Wooster, Ohio.
MACKEY, HORACE W., D.V.M., Marion, Ky.
MARTIN, JOHN G., D.V.M., 1315 Oakview Rd., Ashland, Ky.
MASTERSON, RALPH A., D.V.M., 421 Sweigart St., New Lexington, Ohio.
MILLER, ROBERT L., D.V.M., 189 Sherman Ave., Ashland, Ohio.
MITCHELL, PAUL J., D.V.M., 2901 Grasmere Ave., Columbus 11, Ohio.
MOTYCKA, LEWIS M., D.V.M., Box 11, Latchie, Ohio.
PALMER, CLAYTON S., D.V.M., Stewart, Minn.
PARRETT, CAREY M., D.V.M., Milford, Ind.
POSTLE, DONALD S., D.V.M., 1452 N. High St., Columbus, Ohio.
PRICE, DONALD A., D.V.M., Experiment Station, Sonora, Texas.
QUINLAN, THOMAS J., D.V.M., 2775 Allegheny Ave., Columbus 9, Ohio.
RICHARDS, EDWIN D., D.V.M., R.F.D. 1, Mineral Ridge, Ohio.
RODGERS, VERNON A., D.V.M., 249 Miles St., Akron 6, Ohio.
SAX, NORMAN, D.V.M., 10509 Clairdoan Ave., Cleveland, Ohio.
SCHNEIDER, DALE E., D.V.M., 2610 Fulton Rd., N.W., Canton, Ohio.
SCHUBERT, ROBERT L., D.V.M., 3123 13th Ave., Columbus 3, Ohio.
SEGALL, SAMUEL, D.V.M., 536 Falls Ave., Youngstown 2, Ohio.
SMITH, JAY B., D.V.M., 107 W. Sacra Via, Marietta, Ohio.
SOLOMON, JOSEPH A., D.V.M., 2841 Hampshire Rd., Cleveland Heights, Ohio.
THOMPSON, ORVILLE C., D.V.M., Rt. 3, Bowling Green, Ohio.
WALTER, WILLARD G., D.V.M., Drake Rd., Strongsville, Ohio.
WEARLY, W. KEITH, D.V.M., 224 W. Woodruff Ave., Columbus 1, Ohio.
WEIMER, JOHN R., D.V.M., Bethany, W. Va.
WELLS, ROBERT T., D.V.M., Box 602 Pennville, Ind.
WENGER, JOHN B., D.V.M., 3123 Cleveland Ave., N.W., Canton, Ohio.
WHITEHEAD, CHARLES E., D.V.M., Rt. 1, Falmouth, Ky.

Wurm, Melvin A., D.V.M., Rt. 3, Westerville, Ohio.
Ziegler, Floyd M., D.V.M., 1471 E. Columbus St., Columbus 6, Ohio.

Quebec Veterinary School

Desrosiers, Paul, D.V.M., Bromptonville P.O. Box 653, Cte Richmond, Quebec.
Jolicoeur, Gerald, D.V.M., Ste-Genevieve-de-Batiscan, Cte Champlain, Quebec.

Texas A. & M. College*

Albright, Dan J., D.V.M., Box 2512, College Station, Texas.
Balentine, Don T., D.V.M., Rt. 2, Alvarado, Texas.
Bebinger, John R., D.V.M., 104 St. Cloud Rd., San Antonio, Texas.
Bostwick, Malcolm O., D.V.M., 328 W. Madison St., Bastrop, La.
Botard, Richard M., D.V.M., R.F.D. 1, Box 18, Alice, Texas.
Brandes, Paul P., D.V.M., R.F.D. 3, Weimar, Texas.
Cargill, Howard W., D.V.M., Rt. 3, Bryan, Texas.
Clark, Carey E., Jr., D.V.M., 1001 N. Madison St., El Dorado, Ark.
Clarke, Louie P., Jr., D.V.M., 112 E. Williams, Breckenridge, Texas.
Cleere, Harris N., D.V.M., Box 994, College Station, Texas.
Clifton, William W., D.V.M., Rt. 3, Decatur, Texas.
Clooney, Frederick B., D.V.M., 1601 Skinner Rd., Houston 10, Texas.
Corbett, Charles M., Jr., D.V.M., Box 344, Raymondville, Texas.
Coulter, Joseph B., Jr., D.V.M., 4342 Boca Chica Blvd., P.O. Box 250, Brownsville, Texas.
Dobbins, Stewart M., D.V.M., 910 Second St., Roscoe, Texas.
Drapela, Charles F., Jr., D.V.M., 2202 Colquitt St., Houston 6, Texas.
Egan, William F., D.V.M., Box 468, Kingston, Texas.
Emmett, Robert A., D.V.M., Box 7, Hamilton, Texas.
Flowers, Archie I., D.V.M., 2919 S. Wayside Dr., Houston 3, Texas.
Foster, Richard W., D.V.M., 106 E. South St., Uvalde, Texas.
Gibbens, Roy, Jr., D.V.M., Box 1571, College Station, Texas.
Giebel, Leroy H., D.V.M., Box 1419, College Station, Texas.
Griffin, Thomas P., D.V.M., 508 E. Kingsbury, Seguin, Texas.
Hallmark, James F., D.V.M., 418 Live Oak St., Dublin, Texas.
Harrel, Clifton H., D.V.M., 725 W. Richard, Kingsville, Texas.
Hicks, Stanley G., D.V.M., Box FF, Hobbs, N. M.
Hoban, James E., D.V.M., P.O. Box 1111, College Station, Texas.
Holekamp, Conrad T., D.V.M., Box 547, Junction, Texas.
Hughes, Robert J., D.V.M., Rt. 1, Box 63, Dickinson, Texas.
Ivy, Wilman W., D.V.M., Box 1768, College Station, Texas.
Johnson, Lester, D.V.M., Box 63, Ravia, Okla.
Jones, James P., D.V.M., Box 87, Brady, Texas.
Keen, Floyd R., D.V.M., Hugo, Okla.
Keir, David H., D.V.M., 2822 West Highway, McAllen, Texas.
Kelsey, Joe F., D.V.M., 125 E. Ave., Lawton, Okla.
Kilgore, Robert L., Jr., D.V.M., 1202 Ave. E, N.W., Childress, Texas.
King, Herbert J., Jr., D.V.M., Seguin, Texas.
McAda, Acie C., D.V.M., Box 1952, College Station, Texas.
McConnell, Stewart J., D.V.M., Box 94, Jonesboro, Texas.
Martin, Everett C., Jr., D.V.M., Box 89, Rt. 3, Bryan, Texas.
Massey, James L., D.V.M., 655 Oakland St., Beaumont, Texas.
Mathis, Bob M., D.V.M., Rt. 1, Box 268, Wichita Falls, Texas.
Mayse, Billy R., D.V.M., 1507 S. Wall St., Brady, Texas.
Meyer, Hubert O., D.V.M., 1300 S. Main St., Las Vegas, Nev.
Neville, Francis N., Jr., D.V.M., c/o Dr. C. F. Gobert, 109 E. Flaget St., Bardstown, Ky.
Peterman, William B., D.V.M., 1316 Lee Ave., Fort Worth 6, Texas.
Prince, Rillius E., Jr., D.V.M., 200 Border St., Orange, Texas.
Reeves, Johnie L., D.V.M., 1204 W. 10th, Austin 21, Texas.
Riddle, Donald I., D.V.M., Pecos, Texas.
Robbins, Jack D., D.V.M., Box 185, Coolidge, Texas.
Routh, Samuel C., Jr., D.V.M., R.R. 2, Ballinger, Texas.
Simpson, Roscoe E., D.V.M., 601 Barnes St., McKinney, Texas.
Soyars, Erwin L., D.V.M., Sabinal, Texas.
Stewart, William H., D.V.M., 602 McNair St., Navasota, Texas.
Thomas, George N., D.V.M., Box 1073, College Station, Texas.
Thomas, Saunders M., Jr., D.V.M., Box 2069, College Station, Texas.
Tillett, Henry A., D.V.M., 525 Popular St., Abilene, Texas.
Tumlinson, Robert G., D.V.M., R.R. 1, Cameron, Texas.
Wallace, Hugh M., Jr., D.V.M., Mound City, Mo.

WILKINS, JOHN F., D.V.M., P.O. Box 915, College Station, Texas.

WILLIAMSON, JACK H., D.V.M., Lufkin, Texas.

WOODS, ALAN, D.V.M., 3501 Harvard, Dallas 5, Texas.

YOUNG, ROBERT J., D.V.M., 1714 Richmond Rd., Houston, Texas.

YOUNG, VARLEY F., D.V.M., Box 1122, College Station, Texas.

COMMENCEMENTS

Alabama Polytechnic Institute.—At the annual commencement exercises of the Alabama Polytechnic Institute, Auburn, on June 3, 1950, (*see* picture for names of candidates) the following awards were made to members of the School of Veterinary Medicine:

The Borden Award ($300) for highest scholastic average for first three years, to Wilton E. Blake.

John Gillman Award ($25) for scholastic standing and efficiency in surgery and medicine, to James L. Chambers.

W. A. Davis Award for outstanding clinicians in large and small animal clinics, to Cecil B. Lowman, first, $15; Paul M. Newberne, second, $10.

Student Chapter of the AVMA Award for the

Graduating Class, School of Veterinary Medicine, Alabama Polytechnic Institute

Bottom row (left to right)—Tom S. Maddox, James S. Kelly, Jr., Claude V. Jameson, C. Ray Jones, Thomas L. Allen, B. L. Carraway, Alfred F. Reid, Jr., Dan G. Parmer, Karon R. Jennings.

Second row—George W. Jones, Lewis E. Richardson, Max M. Foreman, Charles W. Field, James L. Chambers, Ernest D. Stuart, David C. Stone, W. P. Monroe.

Third row—Homer R. Campbell, Jr., Billy S. Austin, Lamar H. Moree, Hoyt E. Peeler, G. J. Wheeler, W. L. Taylor, Thomas M. Miller.

Fourth row—Carson N. Copeland, J. E. Morrison, G. W. Patterson, French P. Wise, Walter H. Burgess.

Fifth row—Glen W. Hunt, Wm. W. Clements, Wilton E. Blake, Joseph A. Schmitz, C. E. Pilgreen.

Sixth row—Cecil B. Lowman, Bert R. Allen, Mark G. Hazard, Charles S. McCain, James M. Platt, John A. Cobb.

Seventh row—A. Maxie Davis, B. F. Rosumny, Jr., Victor H. Driscoll, N. J. Thomas, F. B. O'Neal, H. W. Winkler.

Eighth row—William F. Bozeman, John L. Box, J. P. Faust, K. L. Swafford, Wm. D. Staples, Jr., Stuart E. Burnett.

Ninth row—R. J. Williams, Jr., Orello F. Hunter.

Students not in picture—Charles B. Goodell, C. W. Kidder, Charles V. Lang, Jr., Richard C. Mann, S. R. McMaster, Wm. R. Miller, D. C. Moore, Jr., J. W. Newberne, P. M. Newberne, Wm. E. Plummer, N. C. Prickett, John W. Tisdale.

senior outstanding in scholarship, personality, character, and intensity of purpose, to Max M. Foreman.

Tedder Award ($100 in instruments) for proficiency in applying what he has learned, to Nathan J. Thomas.

Women's Auxiliary to the AVMA Award ($25) for special contribution which advances the standing of the veterinary college on the campus, to James W. Newberne.

Albany Serum Company Award ($50 in instruments or drugs) to the junior veterinary student most likely to succeed in the practice of veterinary medicine, the recipient to be determined by popular vote of the junior class, to Charles J. Ogletree.

The Upjohn Company Awards for proficiency in large animal clinical studies, to James P. Faust; and small animal clinical studies, to Victor H. Driscoll.

Danforth Summer Leadership Training Scholarship to outstanding male freshman student, to F. Earl Becker. This scholarship includes the entire attendance cost of two weeks of intensive leadership training at the American Youth Foundation Leadership Training Camp, Shelby, Mich.

s/R. S. SUGG, *Dean.*

• • •

Colorado A. & M. College.—The commencement exercises of Colorado A. & M. College were held on June 9, 1950, with the largest class in the history of the institution being graduated from the Division of Veterinary Medicine. The following were awarded the D.V.M. degree.

Wilbur A. Aanes
Eugene S. Aby
John R. Annis
Clark G. Andis
Donald E. Bailey
Frederic L. Bailey
Robert C. Bay
James C. Beckley
Ray W. Beery
Lloyd G. Best
Edwin D. Boice
Willis A. Brown
Walter E. Bryant
Allen R. Carnes
Earl R. Cline
David G. Colmey
Walter F. Condon
Henry H. Cook
James H. Crawford
Clarence A. Delli Quadri
Oliver D. Dorothy
Jack D. Douglas
John K. Emerson, Jr.
Theodore A. Farmer
Francis G. Fielder
Andrew F. Giambroni
Cecil F. Gouchenour
Walter R. Graham
Chet R. Griffith
Kenneth W. Grush
George A. Hamilton
Eugene D. Haynie
Weldon T. Heard
Millard W. Ickes
Robert W. Kennedy
Ralph C. Knowles
Benjamin H. Konishi
Edward G. LeDonne
Daniel J. Lyons
James C. McMillin
James I. Manning
George Murphy
George H. Murray
Edward P. Olmstead
John A. Pallaoro
Frederick W. Petersen
Wesley P. Peterson
James C. Pitcher
Philip N. Ramsdale
Burt H. Rice
Howard M. Ropa
Herman Ross
Herman D. Schroeder
Victor I. Sorgen
Benjamin R. Stahmann
Carl S. Tinsman
John C. Vinson
Jennette G. Von Tour
Charles Webster, Jr.
John K. Winkler
Paul T. Wise
Charles W. Yunker
Donald V. Zander

Edward P. Olmstead had the highest average in the Division. Those graduating with distinction were:

Clark G. Andis
Robert C. Bay
Robert W. Kennedy
Benjamin Konishi
Edward P. Olmstead
John A. Pallaoro
Burt H. Rice
John C. Vinson
Charles W. Yunker

An honorary degree of D.Sc. was bestowed upon Dr. I. E. Newsom ('04) dean emeritus of the Division of Veterinary Medicine and president emeritus of the Colorado A. & M. College.

The highest award of the alumni association of the institution was presented to Dr. William H. Feldman ('17). This award is given annually to the person who has made an outstanding contribution in his field since graduation. Dr. Feldman's services to, and associations with, various learned societies are so numerous that they scarcely need mentioning.

• • •

University of Georgia.—At the first annual commencement exercises of the School of Veterinary Medicine, University of Georgia, Athens, on June 5, 1950, the following candidates were presented for the D.V.M. degree.

Donovan B. Bell, Jr.
Carl A. Blount, Jr.
James T. Bryson
John L. Christopher
Walter G. Cook
Laurence T. Crimmins
Quincy L. Darbyshire
Calvin M. Davis
Ollie M. Dodgen
Arthur L. Dorminy
Roscoe L. Drake
Frederick Ducey, Jr.
Obe D. Dye, Jr.
James H. Fisher
Ernest R. Griner
Clarence B. Grubbs
Lollis H. Hardy
Gaynor W. Henry
John G. Herring, Jr.
Deward E. Hightower
Byron F. Hilliard
Lois E. Hinson
Lecel T. Leard
Charles W. Leonard
Robert L. Lott
Edward L. McConnell
Paul A. McDonald
Charles N. McNeill
John T. Mercer
Ralph C. Mobley
Murry E. Nunnery
Joseph O'Connor
Jack R. Palmer
Harley A. Phillips
Clyde M. Reagan
Robert O. Shannon
Felix M. Smith
William V. Smith
Dawson L. Taylor
John B. Thomas
Walter G. Thomas
Jack G. Tuttle
William Watson, Jr.
Charlie L. Williams
Charles W. Wincey

• • •

Iowa State College.—Sixty-seven students received the D.V.M. degree at the commencement exercises of the Iowa State College on June 9, 1950 (*see* picture for names of candidates). Donald M. Anderson was the honor

student and winner of the George Judisch Award. Winners of the G. G. Graham Awards, based on the records of the work in clinical practice, were Robert T. Speaker, first; and James M. Hollen, second.

The following graduate veterinarians were granted advanced degrees: Dr. K. H. Randolph (ISC '50), M.S. in veterinary anatomy; Dr. H. J. Ruebke (ISC '43), M.S. in veterinary bacteriology; Dr. G. R. Carter (OVC '43), M.S. in veterinary bacteriology.

s/H. D. BERGMAN, *Dean.*

• • •

Kansas State College.—At the commencement exercises of Kansas State College May 28, 1950, the following candidates were presented for the D.V.M. degree.

Miles H. Agee
Joe W. Atkinson
James M. Barclay
Lester J. Barger
Ralph L. Barrett
Manuel Bendersky
Charles C. Bickley
Ralph L. Bishop
Robert C. Boobar
Benjamine R. Brake
Sydney R. Byrd
Arthur Carlson, Jr.
Wayne B. Chapin
Robert M. Crispell
Melvin Dietrich, Jr.
Charles W. Downing*
Clifford H. Eby
Richard D. Elliott
Harlan D. Ellis
Howard H. Furumoto*
Sidney Galinko
John W. Ganby
Calvin C. Gatz
Leonard O. Goodloe

Graduating Class, Division of Veterinary Medicine, Iowa State College

Top row (left to right)—R. H. Ahrens, D. T. Albrecht, L. C. Allenstein, Dr. M. A. Emmerson, Dr. C. H. Covault, Dr. H. L. Foust, Dean H. D. Bergman, Dr. G. R. Fowler, Dr. I. A. Merchant, Dr. E. A. Benbrook, D. M. Anderson, S. R. Anderson, D. C. Baker.

Second row—L. L. Bates, C. E. Bea, L. H. Bell, C. J. Bierschwal, Jr., L. F. Bunge, L. J. Cahalan, W. M. Campbell, J. J. Cecil, H. J. Chudomelka, F. R. Clark.

Third row—A. W. Cooper, R. J. Cowles, D. H. Crawford, R. R. Dappen, A. W. Dobson, J. J. Edenburn, R. G. Feldman, T. J. Flynn, D. A. Fuller, K. M. Giese, D. E. Gubser, E. A. Gubser.

Fourth row—R. M. Hacecky, R. E. Hall, D. W. Hart, W. W. Herman, J. M. Hollen, S. G. Hull, L. T. Jacobson, J. G. Killian, Jr., W. A. Kittrell, R. E. Kline, E. G. Kocher, H. E. Koeppen, J. P. Lannan.

Fifth row—E. E. Linn, G. N. Lukas, G. I. Luymes, M. E. Macheak, J. D. Melcher, R. E. Misner, R. A. Moore, R. L. Muhm, G. V. Peacock, C. J. Pfow, M. G. Poole, D. W. Poppen, R. J. Potter.

Sixth row—K. H. Randolph, A. W. Riepma, B. F. Schlegel, R. E. Severson, R. T. Speaker, C. M. Towers, W. E. Tyler, R. W. Urbatsch, T. R. Weatherly, H. E. Weimer, R. L. Winterfield, R. S. Zenor.

Walter J. Gough
Jack D. Groff
Richard C. Groff
William C. Gross*
William W. Harris
Harold V. Henderson
Alex Hogg*
Herndon P. Honstead*
Wendell O. Kelley
Arden G. Kemler
William P. Kirkeminde
Don F. Lee, Jr.**
Robert E. McCutcheon
James A. McKitterick, Jr.
Sidney Marlin
Victor A. Miller
Donald W. Mills
Bernard F. Mowery
Francis Murry
Charles G. Nace
James F. Neal
Henry W. C. Newberry
Dean I. Newton
James R. Olin
Dearrold I. F. Palmer
James L. Palotay
Daniel Paradee
Charles F. Parker
Raymond M. Parker
Harold P. Peffly
Charles Reid
Ned W. Rokey
Michael H. Roller
Paul A. Schoonhoven
Robert D. Schupbach
Joe W. Selby
Fredrick I. Skinner
William E. Snodgrass
Frank C. Stiles, Jr.
Frank F. Sutton
William F. Thogmartin
Donald E. Torkelson
Andrew N. Vedros
John G. Wadsworth
Robert J. Weaver*
Andrew C. Wheeler
Robert H. Williams

*With honors. **With high honors.

Graduates commissioned in the U. S. Army Veterinary Corps Reserve are Harlan D. Ellis, James F. Neal, James R. Olin, Daniel Paradee; in the U. S. Air Force Veterinary Corps Reserve, Arthur Carlson, Jr., Wayne B. Chapin, Robert M. Crispell, Richard D. Elliott, William P. Kirkeminde, Henry W. C. Newberry, Michael H. Roller, and William F. Thogmartin. William C. Gross

Graduating Class, School of Veterinary Medicine, Michigan State College

Top row (left to right)—R. C. Beach, G. N. Bennett, G. Biswal, D. E. Bloomquist, A. L. Britt, R. E. Brown, C. H. Cole, G. L. Crenshaw, M. Day, A. G. Dehn, G. Diamant, W. A. Dornbos, T. O. Doyle.
Second row—J. S. Dunlap, S. H. Flora, W. J. Fuller, H. N. Geiger, R. A. Gessert, R. H. Goodale, D. E. Gray, J. E. Gray, C. W. Gunn, C. J. Gurneau, R. M. Hafner, A. L. Hanson, L. E. Hanson.
Third row—L. E. Hanson, L. A. Hartrick, G. E. Hawley, Dean C. S. Bryan, W. J. Hegenauer, G. Heneveld, M. L. Higgins, W. J. Johnson.
Fourth row—W. R. Johnston, H. M. Klein, F. D. Knippling, R. D. Lamser, C. H. Larson, R. E. Lee, S. A. Lindsay, G. A. Linton
Fifth row—M. L. Livingston, D. H. McWade, M. D. Mitchell, T. A. Mott, E. Oja, W. H. Patton, H. C. Petree, R. M. Phillips, R. A. Rann, B. A. Robinette, L. E. Schmidt, A. W. Smith, R. B. Solac.
Sixth row—C. E. Spaulding, R. J. Swarts, J. E. Swonder, R. L. Taylor, W. B. Van Aken, G. E. Webb, C. H. Weber, G. L. Whitehead, G. S. Whyte, J. A. Williams, J. D. Williamson, B. H. Youn, J. R. Young.

was winner of the Borden Award for 1949-1950. The following received the M. Sc. degree: Drs. Earl J. Splitter, Marvin J. Twiehaus. The Ph.D. degree was conferred on El-Sayed Mohammed Hegab Gaafar, Fuad I University, Giza, Egypt.

• • •

University of Missouri.—At the first annual commencement exercises of the School of Veterinary Medicine, University of Missouri, Columbia, on June 9, 1950, the following candidates were presented for the D.V.M. degree.

Warren D. Brainard
Floyd E. Coley
Marshall D. Conrad
Wesley W. Crenshaw
Harold C. Eckhoff
James H. Evans
James K. Farrell
Jesse L. Hartley
Joseph C. Hughes
Robert P. Jones
George Knappenberger
Edmund J. Krautmann
Ray D. Ledgerwood
James C. McCrea
Gerald L. McKee
Maurice Miller
William J. Minor
Harold W. Pilcher
Elmer B. Powell, Jr.
Warren C. Schilb
W. L. Schondelmeyer
James R. Seelbach
John B. Simpson
Paul H. Thom
Thomas D. Wills
Paul E. Zollman

• • •

Ontario Veterinary College.—War Memorial Hall, Ontario Agricultural College, Guelph, on May 26, 1950, was the site of the solemn convocation of the University of Toronto for conferring the D.V.M. degree. The graduating class of 123 was presented to the University by Chancellor The Rt. Hon. Vincent Massey and the candidates individually by Principal Andrew L. MacNabb of the College. President Sidney Smith of the University delivered the graduating address. The following candidates received the D.V.M. degree.

With First Class Honors

Percival D. Armstrong
John M. Baker
Joan Belcher
Clifford I. Chappel
James B. Clapp
Charles L. Cook
Colin R. Craggs
Douglas G. Dale
Leonard J. Dolan
Andrew S. Greig
Desmond H. Hill
Cherry Anne Hooper
Peter R. Linton
Alvin R. MacKay
Douglas C. Maplesden
Clifford A. Mizzen
James F. McCorquodale
John L. McManus
James G. Purdy
Alexander Robertson
Geoffrey J. Rourke
William A. Seymour
Alton N. Smith
Edward S. Starrak

Robert W. Abell
Donald S. Adams
Alister R. Anderson
Robert J. Avery
George F. Badame
Grant L. Bowlby
Harry K. Brown
William R. Bryans
William G. J. Brydges
John A. Campbell
Robert A. Carreau
Trafford W. Carvell
Wilbert R. Chappel
Murray C. Connell
Harold W. Cooper
Ross C. Croucher
Donald W. Cummins
Norman M. Curry
Allen N. Davis
Wallace G. Diehl
Ian M. Dryden
Leslie G. Eaton
George N. Edwards
Albert R. Elliott
Arthur E. Ferguson
Thomas H. F. Ferguson
Bruce R. R. Fife
George C. M. Firman
David W. Gaunt
Robert K. Gay

Graduating Class, New York State Veterinary College, Cornell University

Top row (left to right)—W. L. Miller, G. E. Lawrence, C. E. Markham, W. I. Gay, W. J. Sickles, J. C. Siegrist, R. G. Morris, S. M. Aldrich, R. D. Lambert, M. Schmidt, Jr., J. Puleo, Jr., A. O. Severson, W. F. Haenel, D. B. Tuthill, L. M. Beakman, A. H. Uhlendorf, R. P. Raemsch, S. E. Garrison, A. C. Lewis, R. E. Fuechsel, A. E. Hixon, S. L. Ross, J. W. Grogan.

Second row—G. W. Wicks, Jr., V. M. Loomis, L. G. Palmer, J. P. Ostrander, R. J. Stack, S. M. Phillips, R. J. Harris, J. L. Van Aken, M. E. Adsit, H. J. Deutsch, J. F. Hammond, N. Simon, P. W. Padgot, J. W. Rich, H. F. Simon, D. J. Hannigan, S. R. Rockwell, E. M. Jones, S. V. Jones, G. E. McCarthy, V. E. McKenna.

Third row—M. C. Peckham, M. Zimmerman, Prof. A. M. Mills, Prof. C. G. Rickard, Prof. P. Olafson, Prof. M. G. Fincher, Prof. M. E. Miller, Prof. E. P. Leonard, Prof. H. H. Dukes, Miss Jean Holzworth, Prof. H. C. Stephenson, D. H. Crispell, H. L. Szlachta.

Alfred H. Godwin
Lawrence G. Gould
George E. Harrison
Robert O. Harvey
James I. Higgins
Austin W. Hill
George F. Hood
Thomas V. Johnston
John F. Judiesch
William J. M. Kirk
William J. Langill
Maurice P. L'Heureux
Samuel S. Lowe
Arthur A. MacDonald
Duncan C. MacKay
Linton T. McDonnough
Donald M. L. McGee
John A. McKenzie
Peter D. McKercher
Angus F. McLean
James F. McLellan
Russel S. McMahon
John A. McPhedran
William Mc. Martin
Louis J. Matthews
Thomas R. I. Melady
Ronald B. Middleton
Ross A. Mitchell
Lorne G. Murray
Walter N. Nash
Norman G. Nichol
Gordon B. Nimmons
Frank A. Norman
Harold G. Nurse
William H. Nurse
Archibald B. Park
George K. Peck
Joseph G. Peck
Kenneth S. Pennifold
Kenneth W. Perry
Allan B. Rabjohn
Winfield A. Ripley
Frederick Rising-Moore
James I. Robinson
Charles K. Roe
Norman V. C. Sanderson
James W. Saunders
Garfield R. Sherven
James H. Shillinglaw
Raymond E. Shreenan
Joseph S. Shwaluk
Hugh D. Simpson
Douglas C. Smith
Lawrence J. Somers
Alan W. Steel
James M. Stevens
Goodwin Sveinson
George A. Symington
Robert J. Taggart
Joan Tailyour
Joseph P. R. Tallon
James R. Thomson
Roderick H. F. Vaughan
Kenneth Warren
Lafayette J. Waterbury
Donald M. Watt
Lloyd G. Weber
Joseph B. Wilson
Elmer J. Young
Francis J. Zeman

The following awards were presented to members of the graduating class:

Andrew Smith Memorial Medal for most proficient student in theoretic and practical work during the undergraduate course, to John Malcolm Baker.

Ontario Veterinary College Medal for the highest standing in the final examinations, to James B. Clapp.

Second General Proficiency Prize, to James G. Purdy; Third General Proficiency Prize, to Douglas G. Dale.

The Brampton Jersey Fellowship ($1,000) for first class honor standing throughout the undergraduate course, to James B. Clapp. This scholarship provides for graduate study.

W. J. R. Fowler Scholarship to three members of the graduating class for special interest in the prevention and treatment of equine diseases, to Miss Cherry Anne Hooper, George F. Badame, and George K. Peck.

Charles Duncan McGilvray Memorial Prize for the highest standing throughout the academic course, to Alexander R. Brandon.

Graduating Class, School of Veterinary Medicine, University of Pennsylvania

Top row (left to right)—Richard T. Houpt, Wilbur S. Bull, Casper W. J. Green, Ellsworth E. Barber, George L. Stolte, Frederic H. Bathke, John F. Henry, Leonard B. Simmons, Thomas J. Matthews, Rodrigo Brenes, Albert J. Mickish.

Second row—Richard S. Mackensen, John J. Parente, Lawrence H. Taylor, Leon M. Bodie, Frank J. Boggs, Arthur H. Peck, Paul D. Hernandez, Myer C. Z. Palkovitz, Thomas W. Shoemaker, George B. Belloff, Sanford R. Strattan, Rene C. Gnade, Louis Leibovitz.

Third row—Franklin K. Wills, Paul Magure, Harry L. Schultz, James A. Himes, Nicholas J. Biscotte, Richard C. Newsham, Donald C. Kamsler, Frederick H. Stevens, Paul H. Rabin, Woodrow W. Taylor, Robert T. Henry.

Fourth row—Sherman Ames, George W. B. Bragdon, Otho D. Dickinson, John F. Nugent, Clarence M. Stowe, A. Arnold Gruen, Kenneth F. Moist, Graham Miller.

Women's Auxiliary to the AVMA Prize ($25) for special contribution which advanced the standing of the veterinary college on the campus, to Desmond H. Hill.

The Borden Award ($200) for honor standing, to Miss Cherry Anne Hooper. The winner of this award is required to spend two months in field and laboratory study.

Ayerst Award ($200) for honor standing, to Desmond H. Hill. The candidate will be required to spend two months in investigational study.

Austin Laboratories Limited Prize ($50) for the highest standing in clinical subjects, to James G. Purdy.

Pitman-Moore Company of Canada Limited Prize for keen interest and highest standing in poultry pathology and diseases of furbearing animals, to Miss Joan Belcher.

The Holstein-Friesian Association of Canada Award ($50) for interest and practical ability in diseases of cattle, to Duncan C. MacKay.

The Canadian Army Veterinary Corps Award for high honor standing, to Peter R. Linton.

The Ontario Veterinary College Faculty Award for class leadership, to Robert W. Abell.

The Upjohn Company Prize for proficiency in clinical studies, to Clifford Ian Chappel.

s/A. L. MACNABB, *Principal.*

• • •

University of Pennsylvania.—The annual commencement exercises of the School of Veterinary Medicine, University of Pennsylvania, was held June 14, 1950 (*see* picture for names of candidates).

s/R. A. KELSER, *Dean.*

• • •

Tuskegee Institute.—At the second annual commencement exercises of the School of Veterinary Medicine, Tuskegee Institute, Tuskegee Institute, Ala., May 15, 1950, the following can-

Graduating Class, Ecole de Médecine Vétérinaire de la Province de Québec

Top row (left to right)—Jean-Marie Blais, Henri-Paul Blanchet, Alfred Chartrand, Donald Clifford, Lucien Desmarais.
Second row—Paul Desrosiers, Richard Fournier, Onil Hebert, Gerard Jolicoeur, Marcel Labrie.
Third row—Jean-Marie Larivee, Pierre Moreau, Roger Prior, Jean-Paul Sainte-Marie, Lionel Trudel.

Graduating Class, School of Veterinary Medicine, A. & M. College of Texas

Front row (left to right)—Johnie L. Reeves, John R. Bebinger, LeRoy H. Giebel, Lester Johnson, William H. Stewart, W. W. Ivy, R. E. Prince, Jr., Floyd R. Keen, David H. Keir, Stanley G. Hicks, James E. Hoban, Roscoe E. Simpson, John F. Wilkins, Don I. Riddle, A. I. Flowers, R. A. Emmett.

Second row—Alan Woods, Erwin L. Soyars, Stewart McConnell, James F. Hallmark, James P. Jones, Robert L. Kilgore, Sr., Jack D. Robbins, Robert T. Young, Fred B. Clooney, Francis N. Neville, Jr., Hugh M. Wallace, Billy R. Mayse, S. M. Dobbins.

Third row—Robert J. Hughes, III, C. E. Clark, Jr., Thomas P. Griffin, Howard W. Cargill, Conrad T. Holekamp, George N. Thomas, L. P. Clarke, Clifton H. Harrel, Varley F. Young, Malcolm O. Bostwick, Chas. F. Drapela, Jr., James L. Massey, Hubert O. Meyer.

Fourth row—Harris N. Cleere, W. W. Clifton, Robert G. Tumlinson, Richard M. Botard, Saunders M. Thomas, Jr., Joe B. Coulter, W. B. Peterman, Paul P. Brandes, Bob Mathis, C. M. Corbett, Jr., Richard W. Foster, Joe F. Kelsey, William F. Egan, Don T. Balentine.

Fifth row—Acie C. McAda, Dr. H. A. Smith, Dr. W. V. Lumb, Dr. F. P. Jaggi, Dr. A. A. Lenert, Dean I. B. Boughton, Dr. J. C. Swaim, Dr. W. A. Boney, Everett C. Martin, Jr., Dan J. Albright, Herbert J. King, Jr.

Students not in picture—S. C. Routh, Jr., R. Gibbens, H. A. Tillett, J. H. Williamson.

didates were presented for the D.V.M. degree.

Paul L. Anderson	David H. Fennoy
Leander A. Anthony	James Guess
James G. Ball, Jr.	Firpo L. Hurley
Joseph Barr	Robert L. Judkins*
Jodie G. Blackwell	George D. Merrick
John W. Montgomery	Eldridge A. Shay
Charles Roquemore*	Moses A. Simmons
Howard G. Senter	Saul T. Wilson, Jr.

*These students will receive their D.V.M. degrees upon completion of their studies in August.

• • •

A. & M. College of Texas.—At the annual commencement exercises at the A. & M. College of Texas, College Station, on June 2, 1950, 64 candidates were presented for the D.V.M. degree (*see* picture for names of candidates).

AMONG THE STATES AND PROVINCES

Florida

State Association.—The thirtieth annual meeting of the Florida Veterinary Medical Association will be held Aug. 22, at 2:30 p.m. in the Municipal Auditorium in Miami Beach during the AVMA convention. This will be a business meeting only.

S/DR. PAUL VICKERS, *Resident Secretary.*

Hawaii

National Association.—A dinner meeting of the Hawaii Veterinary Medical Association was held at the South Seas, Honolulu, April 27, 1950. The host was Mr. Harold C. Deakin, western division manager of Pitman-Moore Company.

Dr. Ernest H. Willers discussed, with illustrations, "Molokai Sick."

Guests included Dr. Phillip A. Lee of Sacramento, Calif., and A. H. Edmondson of Pasadena, Calif.

On May 17, the members participated in a round-table discussion on "Small Animal Practice" with Dr. J. S. Crawford, Hyde Park, N. Y., acting as chairman.

S/PAUL T. NOMURA, *Resident Secretary.*

Indiana

Ninth District Association.—On May 25,

members of the Ninth District Veterinary Medical Association met in the Graystone Hotel in Bedford with the physicians of the district as their guests. "Rabies" was discussed by the following personnel from the State Board of Health: Dr. J. H. Scruggs; Mr. C. F. Hill, laboratory technician; Dr. W. C. Anderson, M.D. They presented latest statistics, the aids which would help the state board, and outlined the state program. The ensuing discussion was as actively participated in by the physicians as by the veterinarians. It was evident that both professions saw the need of strengthening the present laws governing rabies in Indiana. A combined meeting of physicians and veterinarians is a step forward; similar meetings may be planned for discussing brucellosis and other diseases communicable from animals to man.

Association officers are Dr. H. F. Lopp, Salem, president; and Dr. L. A. Clark, Bedford, secretary-treasurer.

s/J. L. KIXMILLER, *Resident Secretary.*

Missouri

Kansas City Association.—Dr. Marvin J. Twiehaus, assistant professor of pathology, Kansas State College, guest speaker of the May 16 meeting at the Hotel Continental, presented his college's film on bovine allergic dermatitis. Drs. F. H. Suits, Odessa, and R. A. Bruce, Ottawa, Kan., led the discussion.

s/K. M. CURTS, *Secretary*

New York

New York City Association.—The regular meeting of the Veterinary Medical Association of New York City, Inc., was held in Skytop of the Hotel Statler, June 7, 1950. Dr. Ferdinand F. McAllister, M.D., assistant professor of surgery, College of Physicians and Surgeons, Columbia University, spoke on "Aseptic Surgical Technique." His talk was illustrated with motion pictures, part of which showed a venous aorta anastomosis at the coronary band, in kodachrome.

s/C. R. SCHROEDER, *Secretary.*

Graduating Class, College of Veterinary Medicine, Washington State College

Top row (left to right)—Kenneth Binkley, Allan J. Boddy, Jesse F. Bone, Robert P. Brimble, Seabert J. Carter, Stanton M. Child, Charles H. Coleman, Edmund F. Cushing, James M. Deaver.

Second row—Eldon Engel, James D. Erwin, Jay R. Fuller, Robert H. Fuller, Floris M. Garner, Sheridan D. Gates, John W. Greenlaw, W. H. Gustafson, Kenneth C. Hayes.

Third row—Henry C. Hewitt, Harold A. Hilton, D. H. Holtzheimer, Berger Keatts, Carl E. Keely, James R. King, Raymond M. Law, William W. Lien, David L. Low.

Fourth row—James P. Lyons, Jay H. Miller, R. A. Mitchell, C. I. Peckenpaugh, George M. Pirie, Guy E. Reynolds, Robert A. Russell, Charles O. Stirling, James E. Streets.

Fifth row—George M. Thue, Homer B. Webb, Fred J. Wedam, John L. Weibel, Gregg H. Wilson.

Ontario

Refresher Courses at the O.V.C.—The Ontario Veterinary College, in coöperation with the provincial veterinary association, carried out a two-week refresher course at the College July 4-19, 1950. There were 37 lecture, 9 clinic, and 17 laboratory hours in the curriculum devoted to pathology, anatomy, antibiotics, genetics, parasitology, radiology, virology, and nutrition. Among the distractions were baseball, cards, square dancing, reception (by Dr. and Mrs. MacNabb) garden party, and a trip to the Ontario Reformatory for the ladies.

Puerto Rico

Rabies Outbreak in Puerto Rico.—During March of this year, Puerto Rico, considered a rabies-free area, suffered its first outbreak of the dreaded disease in many years. According to laboratory reports from the Rabies Center Laboratory at Montgomery, Ala., 4 cases in dogs have occurred, 1 in the municipality of Rio Piedras, 1 in Trujillo Alto, 1 in Toa Alta, and another in Ciales.

So far, with a possible two exceptions of a cat and a pig, diagnosis has been based on laboratory findings of Negri bodies and experimental inoculations of laboratory animals. Clinical diagnosis in the pig was not conclusively established by Dr. Alfonso Rivera, who examined. According to Dr. Ernest S. Tierkel, U. S. Public Health Service, the cat showed typical symptoms of the disease and a preliminary examination of the brain showed Negri bodies.

The head of an exposed calf, sent to the laboratory for examination, turned out to be positive too. Insular government and bureau veterinarians, as well as private practitioners, are coöperating with health officials to stamp out the outbreak.

Suspicions that the mongoose may be acting as a vector and reservoir have been expressed by veterinarians. The origin of the outbreak has not been determined.

• • •

New Medical School.—The University of Puerto Rico will open its School of Medicine in August. The freshman class has already been selected from numerous applicants.

Under the present plans, the School of Tropical Medicine of Puerto Rico, a worldwide-known institution, will be consolidated with the new medical school.

s/O. A. LOPEZ-PACHECO, *Resident Secretary.*

• • •

Association Meeting.—The Asociación Médico Veterinaria de Puerto Rico met at the Department of Agriculture and Commerce Building on June 2, 1950.

Dr. Ernest S. Tierkel, U. S. Public Health Service, was guest-speaker. The subject was rabies and its control. An interesting sequence of slides was shown.

Among other matters, the subject of unethical distribution of veterinary supply houses was discussed.

The Board of Veterinary Examiners of Puerto Rico was informed as to the illegal practice of veterinary medicine by the extension service in Puerto Rico.

Washington

Students Ask Waiver on Retirement of Drs. Wegner and McCoy.—Students of Veterinary Medicine at Washington State College have petitioned that Drs. E. E. Wegner and John McCoy not be required to retire from teaching under the College retirement age rule. Dr. Wegner, who has been with the school for forty-one years, twenty-eight of them as dean of the College, is scheduled to retire this year and Dr. McCoy, with twenty-four years of service, next year. The students said that in addition to the outstanding experience and ability of these men, a deep personal liking prompted them to request the waiver.—*The Pullman Herald, May 19, 1950.*

FOREIGN NEWS

Italy

Ascoli Returns to Post.—Professor Alberto Ascoli, former refugee from the defunct Mussolini regime, has returned to his post in the University of Milan after several years' sojourn in the United States. He is again writing fluently in periodical literature on subjects that made him famous, and is vigorously promoting artificial insemination and bovine tuberculosis vaccination. "Incongruity and Incoherence in Antituberculosis Vaccination" (*Zoöprofilassi*, Jan., 1950) is an all-embracing view on the attempt to channel BCG vaccination into the bovine field.

Japan

Colonel Scothorn Honored at Farewell Party.—Members of the Japan Veterinary Medical Association honored Lt. Col. Marion W. Scothorn, V.C., first chief of the Veterinary Affairs Division, GHQ, at a farewell party on April 17. In addition to personnel from the association office, the following representatives from the Japan Bureau of Animal Industry, Ministry of Agriculture and Forestry attended: Drs. K. Saito, Y. Tanaka, and J. Nakazawa, chief, assistant chief, and technical official, respectively, of the Animal Hygiene Section; H. Kawashima, chief, Biological Products Division; from the experiment stations: Drs. M. Kobayashi and S. Ishii, director and chief, respectively, of the station for animal hygiene; Mr. Nishioka, chief, General Affairs Section; and Drs. C. T. Beechwood, assistant chief, Veterinary Affairs Division, PH&W, GHQ, SCAP; M. Nakamura,

Azabu Veterinary College; S. Kondo and J. Nakamura, director and vice-director, respectively, Nippon Institute for Biological Science, Inc.; C. Asomura, chief, Milk and Meat Hygiene Section, Ministry of Welfare; Y. Ono, Nippon Veterinary College; Y. Ochi, Tokyo University;

Front row (left to right)—Dr. Y. Tanaka; bus girl; Lt. Col. M. W. Scothorn; Drs. M. Kobayashi; Y. Ebara, second vice-president, J.V.M.A.; S. Sakasegawa, editor-liaison officer, J.V.M.A.; C. T. Beechwood; S. Horio, managing director, J.V.M.A.; M. Nakamura; T. Shimamura, president, J.V.M.A.; K. Saito; bus girl. Second row—Drs. H. Kawashima; J. Nakamura; S. Kondo; Mr. Nishioka; Drs. S. Ishii; J. Nakazawa; C. Asomura; Y. Ono; Y. Ochi; Mr. Nakano, general affairs, J.V.M.A.; Drs. S. Hoshi; S. Okoshi.

S. Okoshi, president, Tokyo Metropolitan VMA and professor at Tokyo University.

The office of the Japan Veterinary Medical Association is a one-story building located alongside the Imperial Palace, commanding a sight of the big moat where rowing is enjoyed.

S/SABAMOTO SAKASEGAWA, *Editor-in-Chief.*

VETERINARY MILITARY SERVICE

New Promotion Requirements.—Special regulations No. 140-155-1 from the Department of the Army, dated Feb. 17, 1950, prescribed the requirements for promotion of officers, other than general officers, in the organized Reserve Corps.

Only reserve officers in the active reserve will be promoted under these regulations and only when a vacancy exists and the requirements of these regulations are met. Promotions will be made, if otherwise eligible, to fill existing position vacancies in units of the organized reserve and to fill vacancies occurring within the authorized allocation for officers assigned to units in the Volunteer Reserve. Vacancies in training units are not a basis for promotion.

The minimum age in grade for officers recommended in the Veterinary Corps Reserve are as follows: first lieutenant, 21 years; captain, 24 years; major, 29 years; lieutenant colonel, 32 years; colonel, 36 years.

The maximum age in grade limitation for Veterinary Reserve Corps officers recommended for promotion are as follows: until Dec. 31, 1950, first lieutenant, 43 years; captain, 46 years; major, 51 years; lieutenant colonel, 55 years; colonel, 60 years. These maximum age in grade limitations for lieutenant, captain, and major are gradually reduced until Jan. 1, 1955. By that time, the maximum age in grade requirement for first lieutenant will be 35; captain, 41; major, 48.

Officers recommended for promotion must have served a minimum time in grade in years as follows: first lieutenant, three years; captain, five years; major, three years; lieutenant colonel, four years.

The minimum training requirements or promotion to the next higher grade are outlined in this regulation. Briefly stated, they require one of the following: (1) successfully completed Army extension courses; (2) demonstration of qualification of higher grade by active duty performance for six months between 1941 and 1946; (3) demonstration of ability to perform the required duties of the higher grade for a period of one year of reserve duty or additional required professional knowledge and experience in civilian occupations which would qualify for the next higher grade. Officers who are on extended active duty for one year or more and have efficiency report ratings for the year that reflect an acceptable performance of duty will be considered having met the minimum training requirements.

Each officer shall have satisfactorily passed a final type physical examination within one year prior to the date of recommendation for promotion.

There are some provisions for officers who are over-age in grade for promotion and when otherwise qualified.

DEATHS

Alexander E. Alva (IND '11), Liberty, Ind., died (date unknown). Dr. Alva had been in general practice.

Frank H. Andrews (UP '94), Syracuse, N. Y., died early in February, 1950.

Julius Cavazzi (BOL '02), Bogota, N. J., died (date unknown).

H. J. Davis (ONT '14), 60, Aylmer West, Ont., died suddenly on April 19, 1950. Dr. Davis was a veteran of both world wars, and was a member of the Ontario legislature for East Elgin in 1929-1934, and mayor of Aylmer in 1927-1928 and 1937-1939. He had been a member of the AVMA.

Henry A. Jasme (CIN '16), Waycross, Ga., died (date unknown). A general practitioner, Dr. Jasme had been inactive for some time.

Alex W. McLeod (ONT '23), Alexandria, Ont., died (date unknown). Dr. McLeod was in general practice in Alexandria at the time of his death.

Effective treatment of tapeworm infestation

Vermifugal and purgative in action, NEMURAL is particularly effective in dogs and adult cats. Moreover, *it acts quickly.*

•

May be administered without a preliminary starvation. Administration usually not followed by emesis. Definite dosage: One 18 mg. tablet for each 8 lbs. of body weight.

Supplied in tablets of 18 mg., bottles of 100 and 500. (Each tablet contains 3.13 mg. arsenic.)

•

Literature and detailed information supplied on request.

NEMURAL

Brand of DROCARBIL

Winthrop-Stearns INC.

NEW YORK 13, N. Y. WINDSOR, ONT.

NEMURAL, trademark reg. U. S. & Canada.

An' Related Topics

WATCH YOUR ENGLISH AND OURS

ITALICS (Continued)

4) *For Cut-in Titles.*—Cut-in (indented) heads of short articles of ten lines or less and of sections into which long articles are subdivided are italicized in AVMA publications. In the "News" section of the JOURNAL, where a smaller font (type size), is used, the cut-in heads are set in boldface, to give visual prominence to the titles. (This paragraph head is an example of that use of italics.) Cut-in heads, however and wherever used, are separated from the text by the usual dot and dash (.—). The use of the colon in that place is not grammatical. Headings of this order in plain type lack both artistic touch and prominence.

5) *For Certain Letters.*—Italicize (*a*) letters referred to as such, as in "the letter *G* may be hard or soft;" (*b*) the mathematical symbols, a,b, x,y, etc.; (*c*) letters in lieu of digits for numbering passages or paragraphs—half enclosed at the head of, and fully enclosed within, paragraphs—*vide*, this paragraph; and (*d*) the lower case Greek letters, α, β, γ, π, etc.

Summarized, these simple rules not only comply with established usage in the field of science but also improve scientific literature in the artistic sense.

6) *For Abbreviations of Foreign Terms.*—All of the abbreviations of foreign terms currently scattered through English prose ought to be set in italics without exception. Speaking only of veterinary literature, failing to italicize them, italicizing some and not others, or shuffling from one style to the other in the same book, journal, or article, comes under the head of *sloppy editorial work*, to quote a well-known editor. If italicizing these abridgments is ignored, let the fault be uniform. No one will quarrel over setting them in plain type, uniformly, but authors patronizing the AVMA press will find their foreign-term contractions printed in sloping type. Moreover, in order to avoid misuse, the

(Continued on p. 24)

COMING MEETINGS

Notices of Coming Meetings must be received by 8th of month preceding date of issue

American Veterinary Medical Association. Annual meeting. The Municipal Auditorium, Miami Beach, Fla., Aug. 21-24, 1950. J. G. Hardenbergh, American Veterinary Medical Association, 600 S. Michigan Ave., Chicago 5, Ill., executive secretary.

Tennessee Short Course for Veterinarians. University of Tennessee, Knoxville, Tenn., Sept. 7-8, 1950. Dennis Coughlin, 1713 Yale Ave., Knoxville 16, Tenn., resident secretary.

Canadian Veterinary Medical Association. Annual meeting. Windsor Hotel, Montreal, P.Q., Sept. 7-9, 1950. Orlan Hall, 215 Third Ave., Ottawa, Ont., Secretary.

Mississippi, Northeast Mississippi Veterinary Association Clinic. Dr. W. L. Stroup's Clinic, Corinth, Sept. 12, 1950. L. W. Turner, Louisville, Miss., secretary.

Missouri, Southeast Veterinary Medical Association. Fall meeting. Dr. J. V. Moore's Hospital, Hayti, Mo., Sept. 20, 1950. F. A. Stepp, 405 West North St., Sikeston, Mo., secretary.

Colorado Veterinary Medical Association. Fall meeting. Denver, Colo., Sept. 28-29, 1950. John W. Harrison, 420 Sunset Dr., Longmont, Colo., secretary.

New Mexico Veterinary Medical Association. Annual meeting. Hilton Hotel, Albuquerque, N. Mex., Oct. 2-3, 1950. O. J. Rollag, 1825 Campus Boulevard, Albuquerque, N. Mex.

Pennsylvania State Veterinary Medical Association. Annual meeting. Galen Hall, Wernersville, Pa., Oct. 4-6, 1950. Raymond C. Snyder, N.W. Corner Walnut St. and Copley Rd., Upper Darby, Pa., secretary.

Purdue University, thirty-eighth annual short course for veterinarians, Oct. 4-6, 1950. L. M. Hutchings, Purdue University School of Agriculture, Lafayette, Ind., chairman.

New England Veterinary Medical Association. Annual meeting. Mohican Hotel, New London, Conn., Oct. 10-11, 1950. C. Lawrence Blakely, 180 Longwood Ave., Boston, Mass., secretary.

International Association of Milk and Food Sanitarians. Annual convention. Dennis Hotel, Atlantic City, N. J., Oct. 13-16, 1950. K. G. Weckel, University of Wisconsin, Madison, Wis., president-elect.

(Continued on p. 26)

Here's
ONE
Dog Food
That
Actually
Contains..

Lean, Red Cuts

OF U.S. GOVT. INSPECTED HORSE MEAT

Including Roasts . . . Steaks and Chops . . .
Fortified with All-Known "Dog-Health Vitamins"
Plus Vital Minerals

KEN-L-RATION

THE QUAKER OATS COMPANY — KEN-L-PRODUCTS DIVISION Chicago, Illinois

DI-OVOCYLIN* a very potent estrogenic substance
Clinically more effective, Di-Ovocylin is slower in absorption, thus giving a marked prolongation of effect. The estrogenic activity of Di-Ovocylin provides a remarkable hormone for meeting many problems of breeding in all species. It is capable many times of extending the breeding life in anestrus females.
Di-Ovocylin is available in the following sizes:
Ampuls, 1 cc., 5.0 mg., cartons of 6 $10.20 per carton
Vial, 10 cc., (0.2 mg. per cc.) $1.44 per vial
Vial, 10 cc., (1.0 mg. per cc.) $3.96 per vial
Vial, 10 cc., (5.0 mg. per cc.) $13.40 per vial
*DI-OVOCYLIN (brand of alpha-estradiol dipropionate) Trade Mark Registered United States Patent Office. Di-Ovocylin, a product of Ciba Pharmaceutical Products, Inc., is distributed to the Veterinary Profession through:
GOSHEN LABORATORIES, INC., GOSHEN, NEW YORK
GOSHEN Leads...

(WATCH YOUR ENGLISH — *continued from p. 22*)

following is a fairly complete list of such terms:

aa	*ana*	of each
ad.	*addatur*	let there be added
a.i.	*ad interim*	in the meantime
ann.	*annales*	annual
a.v.	*annos vixit*	he lived (?) years
Chart.	*chartula*	powder (pharmacy)
cong.	*congius*	gallon
e.o.	*ex officio*	by virtue of office
f.c.	*fidei commissum*	follow copy
f l.	*falsa lectio*	false reading
ft.	*fiat*	make
f.v.	*folio verso*	on the back of the page
h	*hecto-* (prefix)	hundred
h.s.	*hic situs*	here is buried
ibid.	*ibidem*	in the same place
id.	*idem*	the same
i.e.	*id est*	that is
imp.	*imprimatur*	let it be printed
i.v.	*in verbo*	under the word
juv.	*juvenis*	young
loc.cit.	*loco citato*	where cited
m.ft.	*mistura fiat* (pharm.)	let a mixture be made
q.s.	*quantum sufficit*	sufficient quantity
q.v.	*quod vide*	which see
s.d.	*sine die*	no day set
ss.	*semis*	one half
stet	*stet* (not an abbr.)	let it stand
ut inf.	*ut infra*	as below
ut sup.	*ut supra*	as above
viz.	*videlicet*	namely

The rewrite crew of the AVMA press will appreciate compliance with this phase of its adopted usage. There is nicety in attention to such details that does not escape the eye of critics.

(To be continued)

The Bison.—Within the memory of men still living, *Bison americanus*, better known as the buffalo, roamed and flourished in greater numbers, in the Great Plains region alone, than the entire bovine population of the whole United States today, come storm or blizzard or prairie fire or flood or drought, and, needless to say, without army and navy airplanes to drop forage from the sky. That 75,000,000 large ruminants could live and thrive between the Mississippi and the Rockies is a wonder of recorded history without parallel. Man never has contrived a match for Nature.

recommended formulae for treatment of sarcoptic or demodectic mange

Bendane with Benzocaine, and its companion formulae, Bendane, and BeBee Creme, offer the veterinarian a choice of three outstanding proved preparations. While they are primarily intended for sarcoptic or demodectic mange, many veterinarians report their successful application in treatment of a wide range of skin disorders.

BENDANE	per pint . . .	$ 1.95
	per gallon . .	11.75
BENDANE WITH BENZOCAINE		
	per pint . . .	2.25
	per gallon . .	14.75
BEBEE CREME	per pint . . .	2.25
	per gallon . .	14.00

SINCE 1888
as trustworthy
as time itself

SYRACUSE
PHARMACAL COMPANY, INC.

211-215 WOLF STREET, SYRACUSE 8, N. Y.

Distributed by **H. C. Burns Co., Inc., Oakland, Calif. and Portland, Ore. • Jack Webster, Wakefield, Mass. Fox Drug Co., Carthage, N.Y. • A. A. Gutekunst, Grass Lake, Mich. • Richmond Veterinary Supply Co., Richmond, Va.**

TESTED
AMERICAN VETERINARY MEDICAL AND ANIMAL HOSPITAL ASSOCIATIONS
APPROVED

This facsimile of the AVMA-AAHA SEAL OF APPROVAL distinguishes HILL'S DOG FOOD.

It is safe for hospital use and merits your recommendation to clients.

For information write

HILL PACKING CO.
P. O. Box 148 Topeka, Kan.

ALKADOTE
Bolus-Tablets

Toxopexic, demulcent, antacid, chemical reducing agent, to aid in neutralizing toxic substances, especially organic acids produced by fermentation of food stuffs in the alimentary tract, particularly in the rumen.

12	$ .75	doz. 12's	8.50
25	1.25	4-25's	4.80

CURTS-FOLSE LABORATORIES

Pharmaceutical Chemists to the Veterinary Profession since 1918

73 Central Avenue Kansas City, Kansas

(COMING MEETINGS — *continued from p. 22*)

Iowa, Eastern Veterinary Medical Association. Annual meeting. Hotel Montrose, Cedar Rapids, Iowa, Oct. 19-20, 1950. N. R. Waggoner, Olin, Iowa, secretary.

Minnesota, Conference for Veterinarians. Annual conference. University of Minnesota, School of Veterinary Medicine, St. Paul 1, Minn., Oct. 25-26, 1950. W. L. Boyd, 2227 Hillside Ave., St. Paul 8, Minn., chairman.

Mississippi Valley Veterinary Medical Association. Fall meeting. Pere Marquette Hotel, Peoria, Ill., Nov. 1-2, 1950. R. J. Kirkpatrick, 1235 N. Henderson St., Galesburg, Ill., secretary.

United States Livestock Sanitary Association. Annual meeting. Westward-Ho Hotel, Phoenix, Ariz., Nov. 1-3, 1950. Dr. R. A. Hendershott, 1 West State St., Trenton, N.J., secretary.

Cornell Nutrition Conference for Feed Manufacturers. Statler Hotel, Buffalo, N. Y., Nov. 2-3, 1950. F. W. Hill, Poultry Department, Cornell University, Ithaca, N. Y., chairman.

Southern Veterinary Medical Association. Annual meeting. Baker Hotel, Dallas, Texas, Nov. 6-8, 1950. A. A. Husman, 320 Agricultural Bldg., Raleigh, N. Car., secretary.

Third Inter-American Congress on Brucellosis, The. Washington, D.C., Nov. 6-10, 1950. Wesley W. Spink, University of Minnesota Medical School, chairman.

Oklahoma Veterinary Medical Association. Annual meeting. Skirvin Hotel, Oklahoma City, Okla., Jan. 8-9, 1951. Lewis H. Moe, 1736 W. 3rd Ave., Stillwater, Okla., secretary.

Indiana Veterinary Medical Association. Annual meeting. Hotel Severin, Indianapolis, Ind., Jan. 10-12, 1951. W. W. Garverick, Zionsville, Ind., secretary.

Iowa Veterinary Medical Association. Annual meeting. Hotel Fort Des Moines, Des Moines, Iowa, Jan. 17-19, 1951. F. B. Young, P.O. Box 6, Waukee, Iowa, secretary.

Illinois State Veterinary Medical Association. Annual meeting. Hotel Sherman, Chicago, Ill., Jan. 24-26, 1951. A. G. Misener, 6448 North Clark St., Chicago 26, Ill., secretary.

Minnesota State Veterinary Medical Society. Annual meeting. Hotel Nicollet, Minneapolis, Minn., Jan. 31-Feb. 2, 1951. B. S. Pomeroy, School of Veterinary Medicine, University of Minnesota, St. Paul 1, Minn., secretary.

Regularly Scheduled Meetings

Bay Counties Veterinary Medical Association, the second Tuesday of each month. Russell P. Cope, 1205 San Pablo Ave., Berkeley 6, Calif., secretary.

Central California Veterinary Medical Association, the fourth Tuesday of each month. Thomas Eville, Route 1, Box 136H, Fresno, Calif., secretary.

(*Continued on p. 28*)

When an officer in the Veterinary Corps of the U. S. Army or the U. S. Air Force inspects a shipment of meat or other food for armed forces personnel and finds it good, he gives it his stamp of approval.

His *career*, too, merits a stamp of approval.

The knowledge that your service and professional skill as a veterinary officer helps to guard the health and well-being of thousands is in itself a tremendous satisfaction.

But there are other satisfactions, too, that you will appreciate: A veterinary officer enjoys an Army or Air Force commission, with full pay and allowances; travel to and from assignments, with family, at government expense; free medical and dental care; military social life and recreational activities; retirement income; and many other benefits.

Look into this approved career opportunity for your own future! Inquire today for full information about the Army or Air Force Veterinary Corps.

Address your inquiries to:
SURGEON GENERAL, U. S. ARMY
or
SURGEON GENERAL, U. S. AIR FORCE
WASHINGTON 25, D. C.

U. S. ARMY MEDICAL DEPARTMENT
U. S. AIR FORCE MEDICAL SERVICE

It Sure Pays to Feed Farm Animals

SALT PLUS!

—Say Farmers Everywhere

Here's What STERLING BLUSALT Gives Them!

SALT... the *most* important mineral of them all.

COBALT... lack of cobalt causes loss of appetite and stunted growth of animals.

IODINE... regulates functions of thyroid gland and its secretion.

MANGANESE... helps prevent sterility... improves lactation.

IRON... essential for healthy red blood... helps prevent anemia.

COPPER... essential to convert iron into red blood cells.

ZINC... promotes longer life, better growth.

ASSURE YOURSELF HEALTHY, PROFITABLE ANIMALS!

FEED STERLING TRACE-MINERAL BLUSALT

100-LB. BAGS
50-LB. BLOCKS
4-LB. LIKS

Sold by authorized dealers everywhere.

INTERNATIONAL SALT COMPANY, Inc.
Scranton, Pa.

The whale is less affected by disease than any other edible animal in the world. —*Whale Meat Advisory Bureau, England.*

(COMING MEETINGS — *continued from p. 26*)

Chicago Veterinary Medical Association, the second Tuesday of each month. Robert C. Glover, 1021 Davis St., Evanston, Ill., secretary.

East Bay Veterinary Medical Association, bimonthly, the fourth Wednesday. O. A. Soave, 5666 Telegraph, Oakland, Calif., secretary.

Fayette County Veterinary Association, Iowa, the third Tuesday of each month, except in July and August, at Pa and Ma's Restaurant, West Union, Iowa. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

Greater St. Louis Veterinary Medical Association. Ralston-Purina Research Building, St. Louis, Mo., the first Friday in February, April, June, and November. W. C. Schofield, Dept. of Animal Pathology, Ralston-Purina Co., St. Louis 2, Mo., secretary.

Houston Veterinary Medical Association, Houston, Texas, the first Thursday of each month. Edward Lepon, Houston, Texas, secretary-treasurer.

Illinois Valley Veterinary Medical Association, the second Wednesday of even-numbered months. R. A. Case, 400 S. Garden St., Peoria, Ill., secretary.

Indiana Tenth District Veterinary Medical Association, third Thursday of each month. L. A. Snider, New Palestine, Ind, secretary.

Jefferson County Veterinary Society, Louisville, Ky., the first Wednesday evening of each month. F. M. Kearns, 3622 Frankfort Ave., Louisville 7, Ky., secretary.

Kansas City Veterinary Medical Association, the third Tuesday of each month, in the Hotel Continental, 11th and Baltimore, Kansas City, Mo. K. M. Curts, 70 Central Ave., Kansas City 18, Kan., secretary.

Keystone Veterinary Medical Association. School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa., the fourth Wednesday of each month. Raymond C. Snyder, N. W. Cor. Walnut St. and Copley Rd., Upper Darby, Pa., secretary.

Massachusetts Veterinary Association. Hotel Statler, Boston, Mass., the fourth Wednesday of each month. C. L. Blakely, Angell Memorial Animal Hospital, 180 Longwood Ave., Boston, Mass., secretary-treasurer.

Michiana Veterinary Medical Association, the second Thursday of each month. Write R. W. Worley, secretary, 3224 L.W.W., South Bend, Ind., for location.

Michigan, Southeastern Veterinary Medical Society. Herman Kiefer Hospital, Detroit, Mich., the second Wednesday of each month from October through May.

Milwaukee Veterinary Medical Association. Wisconsin Humane Society, 4150 N. Humbolt Ave., Milwaukee, Wis., the third Tuesday of each month. Kenneth G. Nicholson, 2161 N. Farwell Ave., Milwaukee, Wis., secretary.

Monterey Bay Area Veterinary Medical Association, the third Wednesday of each month. C.

(*Continued on p. 30*)

Visit Our Booth at the AVMA Convention and See the Value of Good Nutrition to Animal Health

Just as your efforts are directed toward improving animal health, Purina Dealers are providing better nutrition through proved feeding and management programs. The Purina display at the Miami Beach convention is designed to show that cooperation between the veterinarian and his Purina Dealer can mean greater farm prosperity in their community.

We cordially invite you to visit our convention booth at your convenience.

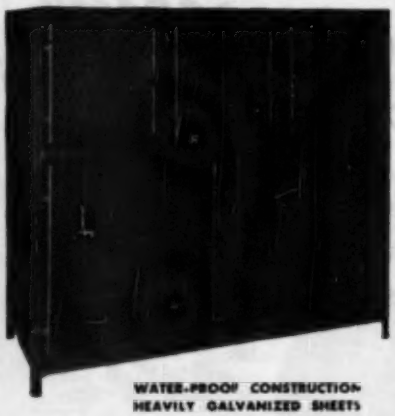
RALSTON PURINA COMPANY
St. Louis 2, Missouri

WORKING FOR A MORE PROSPEROUS AGRICULTURE

"Water-Proof"

5 COMPARTMENT STALLS

$159.00



WATER-PROOF CONSTRUCTION
HEAVILY GALVANIZED SHEETS
NO EXTRA CHARGE!

Bottoms are water-proof trays with ½" turned up edges, heavily soldered together. Braced, aluminum painted. 1½" angle iron frames. Door frames 1" O. D. pipe. Dog proof mesh filler welded to frame. All sheets heavily galvanized.

Completely Assembled. Satisfaction Guaranteed.
SIZES: 3 upper stalls 24" x 24" x 28" deep.
2 lower stalls 36" x 36" x 28" deep.
Overall size: 6' wide x 5'6" high x 28½" deep.
Stalls Stand 6 in. off Floor.

SAFETY

KENNEL RUNS

The low cost will surprise you!

Ford DOUBLE FRAME Panel Runs insure SAFETY for your dogs. Chain link fabric is rust resistant, cannot be spread; permanently locked by INNER BAR FRAME. NO TIE WIRES TO RUST. Clamp together. No bolt holes to match. Portable or permanent construction.

Made in sizes to fit your requirements. 4, 5, and 6 ft. heights. Lengths 2 to 14 ft. panels.

WRITE FOR LITERATURE AND PRICES

Kennel Runs — Pup Pens — Stalls and Cages
Ornamental and Miscellaneous Iron.

FORD FENCE CO., Inc.
6372 Winthrop Avenue
INDIANAPOLIS 20, INDIANA

(COMING MEETINGS — *continued from p. 28*)

Edward Taylor, 2146 South Broad St., San Luis Obispo, Calif., secretary.

New York City Veterinary Medical Association. Hotel Statler, New York, N. Y., the first Wednesday of each month. C. R. Schroeder, Lederle Laboratories, Inc., Pearl River, N. Y., secretary.

North San Joaquin Valley Veterinary Medical Association, the fourth Wednesday of each month. V. E. Graff, Oakdale, Calif., secretary.

Orange Belt Veterinary Medical Association, the second Monday of each month. James R. Ketchersid, 666 East Highland Avenue, San Bernardino, Calif., secretary.

Orange County Veterinary Medical Association, bimonthly, the second Tuesday of each month. J. H. Bower, P. O. Box 355, Santa Ana, Calif., secretary.

Peninsula Veterinary Medical Association, the third Monday of each month. E. W. Paul, Box 866, Redwood City, Calif., secretary.

Redwood Empire Veterinary Medical Association, the second Tuesday of every other month. Charles D. Stafford, Novato, Calif., secretary.

Sacramento Valley Veterinary Medical Association, the fourth Friday of each month. R. C. Goulding, 11511 Capitol Avenue, Sacramento, Calif., secretary.

San Diego County Veterinary Medical Association, the fourth Tuesday of each month. R. J. McFarland, 3621 Jewell St., San Diego 9, Calif., secretary.

Southern California Veterinary Medical Association, the third Wednesday of each month. D. H. McDole, 8674 Melrose Ave., Los Angeles 46, secretary.

South Florida Veterinary Society, the third Tuesday of each month, 8:00 p.m., at the Peckway Skeet Club, Robert P. Knowles, 2936 N.W. 17th Ave., Miami, Fla., secretary.

Tulsa Veterinary Medical Association, the third Thursday of each month, 8:00 p.m., at the Tulsa Hotel. R. S. Todd, 1222 S. Lewis, Tulsa, Okla., secretary.

Foreign Meetings

National Veterinary Medical Association of Great Britain and Ireland. Annual meeting. Cardiff, South Wales, Sept. 3-8, 1950. F. Knight, 36 Gordon Square, London, WC. 1, England, general secretary.

First Pan-American Veterinary Conference. Lima, Peru, May 20-26 (tentative), 1951. José Santivañez, dean, Veterinary College, San Marcos University, Lima, Peru.

Soil deficiencies that cause trouble in animals are not confined to any one section of the United States, although they may occur more frequently along the Atlantic coastal plain or the Northeast than in the Middlewest.—*Nutr. Rev., Dec.*, 1949.

In cases of Neuromuscular paralysis in small animals . . .

*

... and how many animals with neuromuscular paralysis, especially in the posterior region of the spine, have you had to destroy? If your experience with these cases parallels that of other veterinary physicians, you'll be interested — and vitally so — in Physotropin.

Physotropin is an alkaloid and a cholinesterase inhibitor. It has been used successfully in numerous cases of paralysis, usually following injuries, and relieves pain due to muscle spasm.

It has been used in both forms, the injectible and tablet, with success. Our files contain case reports attesting to that fact.

Try it in the next case of neuromuscular paralysis. Order through your wholesaler or direct.

Tablet containing:
Physostigmine
Atropine
Salicylate ... 0.5 mg (1/120 gr.)
Sulfate ..... 0.15 mg (1/400 gr.)

Sterile, isotonic solution containing:
Physostigmine
Salicylate ... 1.0 mg per cc.
Atropine
Sulfate ..... 0.6 mg per cc.

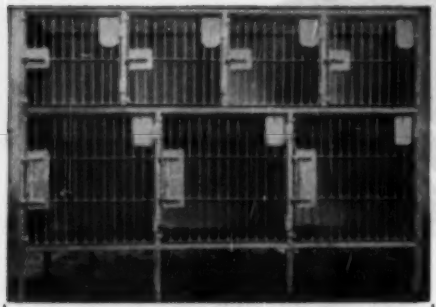
SUPPLIED:
Physotropin Solution: 10 cc Rub-R-Top Vials
Physotropin Tablets: [illegible]

Where trauma, particularly following injuries, results in neuromuscular paralysis . . . try

PHYSOTROPIN

Write for samples and literature.

S. F. DURST & CO., INC., 5317-21 N. 3rd ST., PHILA. 20, PA.



RIVERSIDE ALL STEEL KENNELS—QUALITY FIRST

Seven Compartment. Upper tier 22x20x30. Lower tier 28x28x30. Five Compartment. Upper tier 22x20x30. Lower tier 27x31x30. Sliding doors may be installed between openings for extra large cages if desired. Bottoms of cages are galvanized. MINOR CHANGES IN DESIGN AND EQUIPPED WITH 3-inch ball bearing CASTERS AT NO EXTRA COST. Foolproof latches and identification tags on steel barred doors. Bottom cages have six-inch ventilating strip. Shipment FOB our plant.

5 compartment	$160.00
7 compartment Single	$250.00
7 compartment 3 or more	$237.50 each

TERMS MAY BE ARRANGED IF DESIRED

A lifetime of service and guaranteed by one of California's oldest iron works.

RIVERSIDE IRON WORKS

5422 Mission Blvd. Riverside, California

Veterinary Bulletin

This monthly survey of the literature of veterinary research published by the Commonwealth Bureau of Animal Health, Weybridge, England, contains abstracts of 250 papers each month. The abstracts are informative, to meet needs of research workers, field investigation officers, veterinary public health officers, teachers, and advisory officers.

Annual Subscription:—40s. ($5.60), post free.

Index Veterinarius

This annual publication supplements the *Veterinary Bulletin*. It provides a cumulative index of veterinary literature from 1933 onwards. About 10,000 titles are indexed each year, each title being fully cross-referenced alphabetically under both subject and name of author.

Annual Subscription:—100s. ($14.00), post free.

• • •

Orders for each of these publications may be sent to:

COMMONWEALTH AGRICULTURAL BUREAUX
Central Sales Branch, Penglais, Aberystwyth, Great Britain

CLASSIFIED ADVERTISEMENTS

Twenty-five words or less, $2.50; 8 cents for each additional word. Replies sent in care of the Journal, 25 cents extra.
Remittance must accompany order.

Deadline for want ads 12th of month preceding date of issue.

Names of classified advertisers using key letters cannot be supplied. Address your reply to the key letters, c/o JOURNAL of the AVMA, 600 So. Michigan Ave., Chicago 5, Ill., and it will be transmitted to the advertiser.

Wanted—Veterinarians

VETERINARIAN WANTED—work in A.S.P.C.A. Hospital. Opportunity to assist or perform from 1,500 to 2,000 major operations yearly. Unlimited x-ray and clinical experience. New York license essential. Address Dr. Raymond J. Garbutt, A.S.P.C.A. Hospital, Ave. A. and 24th St., New York, N.Y.

Young graduate wanted for mixed practice in southeastern Ohio. Salary to start; partnership later to right man. Good opportunity if you are not afraid of work. Address "Box X 1," c/o Journal of the AVMA.

WANTED VETERINARIAN—exclusive small animal practice. New Jersey license necessary. Wonderful future for a good man. Address "Box X 6," c/o Journal of the AVMA.

WANTED—Florida-licensed veterinarian to lease small animal clinic in Coral Gables, Miami, Florida. Address Mrs. Marie Brown, 4573 Ponce de Leon, Coral Gables, Fla.

GROUP PRACTICE—Wanted 2 veterinarians interested in establishing group practice in Massachusetts. One must qualify as a top small animal man, the other large animals, preferably cattle. Interesting and promising possibilities. Address "Box X 9," c/o Journal of the AVMA.

VETERINARIAN WANTED—Employment, with excellent future for small animal practitioner in southern California. Address "Box X 17," c/o Journal of the AVMA.

WANTED—recent graduate of AVMA-approved school to assist in small animal practice in Chicago. Good future for person not afraid of work. Address "Box X 18," c/o Journal of the AVMA.

Wanted—Practices

WANTED TO BUY—an established small ani-

(*Continued on p. 34*)

Send for FREE 36-page Treatise on
CARROT OIL VITAMINS

Details the advantages of carrot oil vitamins when used in feeds to improve breeding results: to destroy oxidized milk flavors; and to promote general good health and glossy coats. Contains much information. Replete with data and references. Send for it today.

NUTRITIONAL RESEARCH ASSOCIATES
Dept. 251-M. South Whitley, Indiana

You're Right, Doctor . . .

CANINE CRYSTOIDS®

ANTHELMINTIC

Really are EFFECTIVE and SAFE!

Yes, Canine Crystoids Anthelmintic are probably the safest and most effective of the anthelmintics . . . because each pill contains 0.2 Gm. Caprokol hexylresorcinol, clinically established as unusually safe and effective in the treatment of both round worm (Ascaris) and hookworm infestations in dogs.

Canine Crystoids Anthelmintic are characterized by these four clinical conclusions:

1. A single therapeutic dose, properly given, is from 90 to 100 per cent efficient.
2. The toxicity of the drug is clinically negligible. It is *free from after-effects.*
3. It is efficient against *both* Ascaris and hookworm infestations.
4. The action is *vermicidal.* The worms are killed outright—not merely stupefied—and consequently the danger of migration is obviated.

Supplied in packages of 5 and 100 pills, and in economical hospital packages of 500 pills. *Dosage:* 1 pill for very small puppies of smaller breeds, 2 pills for those of larger breeds. Dogs weighing 20 pounds or over, 5 pills.

VETERINARY DIVISION **SHARP & DOHME** PHILADELPHIA 1, PA.

BRANCHES: Atlanta, Baltimore, New York, Denver, Memphis, Los Angeles, Columbus, Boston, Chicago, Portland, San Francisco, Kansas City, Dallas, St. Louis, New Orleans, Minneapolis.

mal hospital doing enough business to require at least 2 veterinarians to handle. Prefer a warm climate or resort area. Please send details and photo in first letter. Address "Box U 3," c/o Journal of the AVMA.

WANTED TO BUY—established small animal practice by experienced veterinarian financially responsible. Complete details in first letter, with photos or sketch of property. Address "Box X 19," c/o Journal of the AVMA.

Wanted—Positions

Graduate veterinarian, Ontario; married, extensive experience in small animal practice, desires position with definite future. Prefer Ohio, Indiana, or Michigan locale. Address "Box X 12," c/o Journal of the AVMA.

California licensee, Christian, many years experience, references, managing and business abilities, desires position with practitioner, preferably small animal, in southern California with definite possibility of partnership, management, or lease. Will accept relief duty for longer period. Address "Box X 11," c/o Journal of the AVMA.

Barring national emergency, Cornellian, now in Veterinary Corps, experienced in large and small animal practice, available November for permanent situation. Prefer 2- or 3-man partnership. No temporary situations considered unless lucrative non-practice position. Address "Box X 7," c/o Journal of the AVMA.

European veterinarian, 34, with long experience in laboratory and research, specialized in serums and vaccines, seeks adequate position. Address "Box X 3," c/o Journal of the AVMA.

WANTED any kind of veterinary work by '49 graduate of veterinary college in Germany. Am widow with ten-year-old child. Address "Box X 5," c/o Journal of the AVMA.

Veterinarian, graduate from European universities, ten years' experience in small and large animal practices, is searching for employment possibility as an assistant or anything in this line. Address Dr. F. Wyk, 1857 Echo Park Ave., Los Angeles 26, Calif.

Lithuanian veterinary surgeon, who has practiced in field more than fourteen years, desires position as

(*Continued on p. 36*)

NOW! You can furnish your office . . .
PROFESSIONAL
Office Furniture and Fixtures
IN THE COMFORT OF YOUR HOME
Doctors everywhere say it's the easiest and best, most convenient and economical way to furnish a whole office or to buy an odd piece. This unique and amazing catalogue has 96 pages, 8½" x 11". It illustrates, describes and prices more than 500 items!
FREE GET THIS CATALOGUE NOW
FINEST FURNITURE FROM FAMOUS MANUFACTURERS
PROFESSIONAL PRINTING CO., INC.
202 Tillary Street, Brooklyn 1, N. Y. 8-9-0
Send me your furniture and fixtures catalogue, free and without obligation.
Dr. _____
PROFESSIONAL
PRINTING COMPANY, INC.
Americas Largest Printers to the Professions
202-208 TILLARY ST., BROOKLYN 1, N. Y.

BENADRYL
BENADRYL
POSSESSES BOTH ANTIALLERGIC
AND ANTISPASMODIC ACTIVITY
Benadryl in Veterinary Practice
professional literature available on request
DURING SUMMER, skin irritations, dermatoses and other allergic conditions of dogs, cats and farm animals are common. Benadryl® Hydrochloride (diphenhydramine hydrochloride, Parke-Davis) will be found effective in relieving these patients.
In recent years, there has been an abundance of experimental and clinical work reported on the close association of histamine to allergy. Benadryl prevents histamine-induced reactions and it is by this action against histamine that Benadryl affords relief in dermatoses, including eczema and urticaria, which are of obscure origin.
Department of Veterinary Medicine
PARKE, DAVIS & COMPANY
DETROIT 32, MICHIGAN

Service

FOR YOU
and
YOUR
CLIENTS

Produced for the exclusive use of the Graduate Licensed Veterinarian

Grain Belt

ANTI-HOG CHOLERA SERUM

HOG CHOLERA VIRUS

Our entire facilities are directed towards one objective — serving you better with superior quality products — so that you may better serve your clients. No order is too large, no order too small to receive our immediate and careful attention.

GRAIN BELT
SUPPLY COMPANY
4901 SO. 33RD STREET
OMAHA, NEBRASKA

Member Associated Serum Producers, Inc.

(CLASSIFIED ADS — *continued from p. 34*)

assistant veterinary surgeon or in animal hospital. Speaks, reads, and writes English. Address Dr. Steponas Stirbys, 4832 Homerlee Ave., East Chicago, Ind.

Graduate of AVMA-approved school, woman, small animal experience, desires position within 50-mile radius of New York City. New York license. Address "Box X 2," c/o Journal of the AVMA.

For Sale or Lease—Practices

FOR SALE—busy dog and cat hospital. Lucrative practice established over twenty years. Main thoroughfare, Long Island, N.Y. Modern brick hospital completely equipped. Capacity 75. Have to give up practice due to ill health. Exceptional opportunity. Address "Box X 8," c/o Journal of the AVMA.

FOR SALE OR LEASE—animal hospital in New Mexico city of 15,000, established in 1947 in rich oil, ranch, and irrigation section. Hospital complete with 18 outside Ford runs on concrete, three large grass runs, 35 cages (metal), living quarters, boarding building separate from hospital proper, and large corral with three stalls. This practice has grown rapidly and has great opportunities in store. Grossed $17,000 last year and more this year. Radius of practice 50 miles. Address "Box X 10," c/o Journal of the AVMA.

FOR SALE OR LEASE—hospital-residence, two years old, in lake-dairy region of southeastern Wisconsin. Nine acres wooded land on main highway. X-ray, glass block kennels, equipment. Owner leaving United States. Address "Box W 5," c/o Journal of the AVMA.

OPPORTUNITY—Step into successful small animal hospital, best of equipment and established clientèle; keeper's apartment. Spacious, beautified grounds located on main street in fine southwestern city of 75,000. Complete $25,000. Proof of financial ability required. Address "Box X 15," c/o Journal of the AVMA.

FOR SALE—practice established over thirty-five years in county seat in southwestern part of Minnesota, with a population of 3,600. Mixed cattle and hog practice, uses about 1,000,000 cc. of hog cholera serum each year. Will remain with buyer for reasonable time. Will gross over $30,000. Can rent office where I have been for twenty-five years. Price $6,000. Address "Box X 16," c/o Journal of the AVMA.

FOR SALE—mixed practice in Pennsylvania. New home with hospital attached. Beautiful location. Reason for selling, other interests. Price $15,000. Address "Box X 4," c/o Journal of the AVMA.

FOR SALE—small animal hospital in southern California community. No real estate involved. Presently grossing $18,000 per year, and still growing. Modern and well equipped. Price $9,000. Address "Box U 20," c/o Journal of the AVMA.

FOR SALE—established Kentucky general practice, priced reasonable, for cash. Very prosperous county seat town of about 4,000 population. Only

(*Continued on p. 38*)

Make Ear-Cropping Simple

The MacAllan Ear Cropping Form, affixed to the ear, provides an accurate pattern against which to cut with knife or razor blade. Form fits firmly, cannot move or slip when clamped into proper position.

Made of non-rusting, light, cast aluminum, highly polished, the MacAllan Ear Cropping Form will last a lifetime with minimum care. Simplicity of design and construction reduces possibility of breakage or mechanical failure.

Forms immediately available to provide distinctive markings of these breeds:

Boxer
Price, postpaid $15.00

Boston Terrier
Price, postpaid $15.00

Great Dane
Price, postpaid $15.00

Doberman
Price, postpaid $15.00

Set of above four
Price, postpaid $50.00

Forms for other breeds made on special order.

These are all truly "championship" forms. They have been patterned after the earmarkings of dogs who have won top honors in show competition. Patents pending.

STEP 1

STEP 2

STEP 3

Sold to Veterinarians Only

Send Check or Money Order

MacALLAN LABORATORIES
Route No. 2, Box 420 Lansing, Michigan

DEODORANT

For DOG and CAT Hospitals

For Zephyr-fresh air and germicidal cleanliness—

USE D-3, the clear, odorless liquid concentrate; deodorize and disinfect animal cages, kennels and surgeries; non-toxic, non-irritating to any animal. Apply with spray, mop or brush.

—Kills odors arising from all waste; leaves no odor, stain or residue.

—Destroys fungi and bacterial organisms. Has phenol coefficient of 200 when diluted 2 ounces to a gallon of water.

—Cleans all surfaces, wood, metal, concrete, tile, enamel or composition, with rich live germicidal suds.

D-3 saves you money — 3 agents in one; saves you time — 3 operations in one. A gallon of D-3 gives you approximately six weeks' supply.

PRICE ONLY $6.14 PER GALLON
(We pay the postage)

Unconditional Guarantee: Send for D-3 today. Use for ten days — if results are not satisfactory, return the unused portion. Your payment plus the return postage charges will be refunded.

BOBROW PRODUCTS COMPANY
220 S. State Street, Chicago, Ill.

NOW in convenient 5 lb. cans

VITAL COD LIVER OIL

PURE ICELANDIC COD LIVER OIL . . .

Four A and D potencies available. This naturally finer oil with the sunshine color costs less to use than ordinary feeding oil in drums.

Distributed only by

MIDLAND-WESTERN, Inc.
1004 TENNEY BUILDING • MADISON 3, WISCONSIN

WHITE'S ANIMAL CASTRATION

Now ready for sale, a new enlarged text-book for TEACHERS, STUDENTS and PRACTITIONERS, written and published by George Ransom White, M.D., D.V.M.

This book contains 292 pages and 254 illustrations. Each and every operation is illustrated and described. The book is authoritative and instructive. It sponsors the latest, safest and most satisfactory methods of unsexing domesticated animals.

Price $7.50

For sale by book dealers, also by the Author, George R. White, P. O. Lock Box 901, Nashville, Tennessee.

Service

FOR YOU *and* YOUR CLIENTS

Produced for the exclusive use of the Graduate Licensed Veterinarian

Grain Belt

ANTI-HOG CHOLERA SERUM

HOG CHOLERA VIRUS

Our entire facilities are directed towards one objective — serving you better with superior quality products — so that you may better serve your clients. No order is too large, no order too small to receive our immediate and careful attention.

GRAIN BELT SUPPLY COMPANY
4901 SO. 33RD STREET
OMAHA, NEBRASKA

Member Associated Serum Producers, Inc.

(CLASSIFIED ADS — *continued from p. 34*)

assistant veterinary surgeon or in animal hospital. Speaks, reads, and writes English. Address Dr. Steponas Stirbys, 4832 Homerlee Ave., East Chicago, Ind.

Graduate of AVMA-approved school, woman, small animal experience, desires position within 50-mile radius of New York City. New York license. Address "Box X 2," c/o Journal of the AVMA.

For Sale or Lease—Practices

FOR SALE—busy dog and cat hospital. Lucrative practice established over twenty years. Main thoroughfare, Long Island, N.Y. Modern brick hospital completely equipped. Capacity 75. Have to give up practice due to ill health. Exceptional opportunity. Address "Box X 8," c/o Journal of the AVMA.

FOR SALE OR LEASE—animal hospital in New Mexico city of 15,000, established in 1947 in rich oil, ranch, and irrigation section. Hospital complete with 18 outside Ford runs on concrete, three large grass runs, 35 cages (metal), living quarters, boarding building separate from hospital proper, and large corral with three stalls. This practice has grown rapidly and has great opportunities in store. Grossed $17,000 last year and more this year. Radius of practice 50 miles. Address "Box X 10," c/o Journal of the AVMA.

FOR SALE OR LEASE—hospital-residence, two years old, in lake-dairy region of southeastern Wisconsin. Nine acres wooded land on main highway. X-ray, glass block kennels, equipment. Owner leaving United States. Address "Box W 5," c/o Journal of the AVMA.

OPPORTUNITY—Step into successful small animal hospital, best of equipment and established clientèle; keeper's apartment. Spacious, beautified grounds located on main street in fine southwestern city of 75,000. Complete $25,000. Proof of financial ability required. Address "Box X 15," c/o Journal of the AVMA.

FOR SALE—practice established over thirty-five years in county seat in southwestern part of Minnesota, with a population of 3,600. Mixed cattle and hog practice, uses about 1,000,000 cc. of hog cholera serum each year. Will remain with buyer for reasonable time. Will gross over $30,000. Can rent office where I have been for twenty-five years. Price $6,000. Address "Box X 16," c/o Journal of the AVMA.

FOR SALE—mixed practice in Pennsylvania. New home with hospital attached. Beautiful location. Reason for selling, other interests. Price $15,000. Address "Box X 4," c/o Journal of the AVMA.

FOR SALE—small animal hospital in southern California community. No real estate involved. Presently grossing $18,000 per year, and still growing. Modern and well equipped. Price $9,000. Address "Box U 20," c/o Journal of the AVMA.

FOR SALE—established Kentucky general practice, priced reasonable, for cash. Very prosperous county seat town of about 4,000 population. Only

(*Continued on p. 38*)

Make Ear-Cropping Simple

The MacAllan Ear Cropping Form, affixed to the ear, provides an accurate pattern against which to cut with knife or razor blade. Form fits firmly, cannot move or slip when clamped into proper position.

Made of non-rusting, light, cast aluminum, highly polished, the MacAllan Ear Cropping Form will last a lifetime with minimum care. Simplicity of design and construction reduces possibility of breakage or mechanical failure.

Forms immediately available to provide distinctive markings of these breeds:

Boxer
Price, postpaid $15.00

Boston Terrier
Price, postpaid $15.00

Great Dane
Price, postpaid $15.00

Doberman
Price, postpaid $15.00

Set of above four
Price, postpaid $50.00

Forms for other breeds made on special order.

These are all truly "championship" forms. They have been patterned after the earmarkings of dogs who have won top honors in show competition. Patents pending.

Sold to Veterinarians Only

Send Check or Money Order

STEP 1

STEP 2

STEP 3

MacALLAN LABORATORIES
Route No. 2, Box 420 Lansing, Michigan

DEODORANT

For DOG and CAT Hospitals

For Zephyr-fresh air and germicidal cleanliness—

USE D-3, the clear, odorless liquid concentrate; deodorize and disinfect animal cages, kennels and surgeries; non-toxic, non-irritating to any animal. Apply with spray, mop or brush.

—**Kills odors** arising from all waste; leaves no odor, stain or residue.

—**Destroys fungi and bacterial organisms.** Has phenol coefficient of 200 when diluted 2 ounces to a gallon of water.

—**Cleans all surfaces,** wood, metal, concrete, tile, enamel or composition, with rich live germicidal suds.

D-3 saves you money — 3 agents in one; saves you time — 3 operations in one. A gallon of D-3 gives you approximately six weeks' supply.

PRICE ONLY $6.14 PER GALLON
(We pay the postage)

Unconditional Guarantee: Send for D-3 today. Use for ten days — if results are not satisfactory, return the unused portion. Your payment plus the return postage charges will be refunded.

BOBROW PRODUCTS COMPANY
220 S. State Street, Chicago, Ill.

NOW in convenient 5 lb. cans

VITAL COD LIVER OIL

PURE ICELANDIC COD LIVER OIL . . .

Four A and D potencies available. This naturally finer oil with the sunshine color costs less to use than ordinary feeding oil in drums.

Distributed only by

MIDLAND-WESTERN, Inc.
1004 TENNEY BUILDING • MADISON 3, WISCONSIN

WHITE'S ANIMAL CASTRATION

Now ready for sale, a new enlarged text-book for TEACHERS, STUDENTS and PRACTITIONERS, written and published by George Ransom White, M.D., D.V.M.

This book contains 292 pages and 254 illustrations. Each and every operation is illustrated and described. The book is authoritative and instructive. It sponsors the latest, safest and most satisfactory methods of unsexing domesticated animals.

Price $7.50

For sale by book dealers, also by the Author, George R. White, P. O. Lock Box 901, Nashville, Tennessee.

In Muscle, Joint and Tendon Conditions —

Numotizine relieves pain and congestion, promoting comfort and encouraging quick recuperation.

Applied as a poultice, Numotizine increases local circulation, reduces swelling, provides long-continued comfort. One application lasts 8 hours or more.

Supplied in 30 ounce and 3½ lb. resealable glass jars.

NUMOTIZINE ®

— the medicated emplastrum —

NUMOTIZINE, Inc.

900 N. Franklin Street, Chicago 10, Illinois

(CLASSIFIED ADS — *continued from p. 36*)

veterinarian in three counties. Can be expanded as one desires. Address "Box U 2," c/o Journal of the AVMA.

FOR SALE—small animal hospital, main thoroughfare southern California beach city. Excellent real estate value. Two furnished apartments. Now netting $10,000 annually; much greater potential. Address Wayne M. Harris, 833 Prospect St., La Jolla, Calif. Phone: G5-2224, 7032.

FOR LEASE—combination small animal hospital and residence on southeastern Florida coast. Must be Florida-licensed veterinarian. Address "Box X 13," c/o Journal of the AVMA.

FOR SALE—Established small animal hospital in upper New York State with good opportunity for large animal practice. Selling because of health. Address "Box X 14," c/o Journal of the AVMA.

Miscellaneous

PREGNANCY DIAGNOSIS—in the mare from 45th to 150th day. Write for vials and mailing tubes. Price: $7.00; two or more tests, $6.00 each. PREGNANCY DIAGNOSTIC LABORATORIES, H. S. Lames, D.V.M., Dysart, Iowa.

WANTED—young woman with knowledge of medical technology to assist in veterinary hospital. Address Riser Animal Hospital, 5335 Touhy Ave., Skokie, Ill.

For Sale—Miscellaneous

PORTABLE X-RAY UNIT WITH TIMER—Universal Fieldmaster 25 Ma. 85 KVP, list price $618, save $200 at $418 for this floor sample; guaranteed.

PELTON STERILIZER MODEL 214C—Automatic electric; porcelain; with trays $29.50. 14 x 5 x 3½ deep incl. needle tray; guaranteed. SURGICAL SUPPLY SERVICE, 825 WALNUT ST., PHILADELPHIA 7, PA. ESTABLISHED 1935.

SOLID STAINLESS STEEL PANS—2-qt. size flat; each, less than one dozen, $1.75; in dozen lots, each $1.25, F.O.B. Farmington, Mich. Address Dr. H. E. Viergutz, 32809 Grand River, Farmington, Mich.

FOR SALE—Shetland Sheepdogs, sired by son of Champion Golconda, males and females, sable and white, six weeks to six months. Dr. V. Martinson, Granville, Wis.

Books and Magazines

New breed books available—$3 each: Dane, Boston, Springer, Dachs, and Boxer. Keep up on dogs—Dog World: $3 one year, $5 two years. Judy Publishing Co., 3323 Michigan Blvd., Chicago 16, Ill.

STROUD'S DIGEST on the Diseases of Birds. 500-page book, leather bound, embossed in gold—$5.00. 86 drawings, showing operations on birds, etc.; 64-page glossary of medical and breeders' terms: 71 formulas-prescriptions. Detailed so you can recognize bird diseases. 100 book titles on all different pets available; also, 72-page monthly magazine on all pets. $2.00 a year. All-Pets, 18 Forest, Fond du Lac 4, Wis. Anything you buy from us is returnable in ten days.

For Sale—Artificial Insemination Supplies

ARTIFICIAL INSEMINATION INSTRUMENTS—Essential equipment, replacement parts and materials, designed and manufactured especially for artificial insemination. Prompt delivery. New catalog. Address: Breeder's Equipment Co., Flourtown, Pa.

If Americans swallow the "pill" of "free" medicine, we as veterinarians can be sure that we will be next in line for socialization. Farmers have consistently gotten more from the Government than they have asked. Why isn't it natural for them to begin to think, "Why not free veterinary service?" if their doctor bills are paid by the Government.—*R. E. Ruggles, D.V.M., Illinois.*

Historic Journey.—The April, 1949, issue of the *Scientific American* reminded its readers that in 1899, or fifty years ago, Robert Koch of t.b. fame set sail for Africa to study malaria and other diseases in connection with the vector theory of contagion, which the federal veterinary service had proved in the case of Texas fever. The journey became memorable because the mosquito, Aëdes sp., was caught in the act of transmitting the protozoon, *Plasmodium malariae*, from person to person and thus securely established a new field of medical investigation—the vector idea of contagion.

"What's New in Veterinary Science?"

For the answer to that question, more and more practitioners are reading the AMERICAN JOURNAL OF VETERINARY RESEARCH.

Issued quarterly and consisting entirely of original papers, this publication singles out research developments that help solve current problems in the field.

Here, for example, are just a few of the important subjects covered in the pages of the AMERICAN JOURNAL OF VETERINARY RESEARCH during the past year:

- ★ Trichomoniasis in Reproduction
- ★ Diagnosis of Newcastle Disease
- ★ Chemotherapy of Coccidiosis
- ★ Blood Transfusion in Anaplasmosis
- ★ Vitamin Therapy for Calves
- ★ Swine Brucellosis
- ★ Periodic Ophthalmia
- ★ Swine Dysentery
- ★ Baby Pig Mortality
- ★ Bovine Mastitis

— plus many other research reports on disease problems.

Just fill out the coupon below and send it with your check or money order. The subscription price is only $2.50 per year to AVMA members; $4.00 to non-members.*

TO: AMERICAN VETERINARY MEDICAL ASSOCIATION, 600 S. Mich., Chicago 5, Ill.

Please enter my subscription to the quarterly AMERICAN JOURNAL OF VETERINARY RESEARCH for one year.

(If you are an AVMA member, send check or money order for $2.50 with this coupon. If you are not a member, send check or money order for $4.00.*)

Please Print

Subscriber's Name

Street Address or Box No.

Zone State

*The $4.00 non-member rate applies in the U. S., Canada, and countries affiliated with the Pan American Postal Union. Subscription rate for other countries is $4.50.

Liability Insurance

for

AVMA Members

The policy, which was developed especially for Association members two decades ago, provides expert defense against claims and suits arising out of the care and treatment of animals, and will pay, to the extent of the policy limits, all expenses and damages resulting from unfavorable verdicts.

In this suit-conscious age, such protection is not only wise but, as shown by the claim files, a practical necessity.

The insurance is placed with one of the largest and most reliable underwriters in the country.

Write at once for an application and descriptive folder, as the policy year begins on December 1.

American Veterinary Medical Association

600 So. Michigan Ave., Chicago 5, Ill.

Dr. Edds Joins Fort Dodge Staff

Dr. George T. Edds (TEX '36) has resigned from the department of physiology and pharmacology at Texas A. & M. College's School of Veterinary Medicine to join Fort Dodge Laboratories, Inc., Fort

Dr. G. T. Edds

Dodge, Iowa, as director of pharmacologic research. In addition to his D.V.M. degree, Dr. Edds holds a B.S. degree from Texas A. & M., and an M.S. degree awarded by the University of Michigan ('38).

Associated Serum Producers' 1950 Campaign

A new style of "human interest" advertising to further tell the story of major disease hazards in the animal industry, and the importance of veterinary service in coping with these hazards, has been inaugurated as part of the new 1950 campaign of Associated Serum Producers.

The advertisements which will run in 14 major farm publications covering the entire United States will have a circulation of over 6 million readers per issue.

Using a new style of drawings and pictures, they will take up such subjects as hog cholera, erysipelas, mastitis, and others, and will at the same time point to the importance of veterinary service in coping with these and other livestock problems. This is a continuation of the series "What the Veterinary Profession Means to Mankind" which has been carried on over a period of years by the American Foundation for Animal Health under the sponsorship of Associated Serum Producers.

Other phases in the 1950 public relations campaign on behalf of the profession will include news releases, radio releases, motion pictures, cartoons, and illustrated feature articles from coast to coast.

What is so right about this picture?

Is it that Dad's finally retired . . . the old alarm clock gagged for good?

Is it because now Mom won't have to watch him leave for the office any more, looking just a little bit tired?

Or is it because now Dad and Mom will be starting an especially happy time of life *together?*

We think it's all these things—all the things that are only made possible by financial security.

Nearly everyone seeks financial security, but *far too few* find it. That's because financial security seldom is achieved without a *sound, carefully executed* savings plan!

U. S. Savings Bonds offer you two absolutely safe, automatic plans for saving: The *Payroll Savings Plan* where you work or the *Bond-A-Month Plan* where you bank.

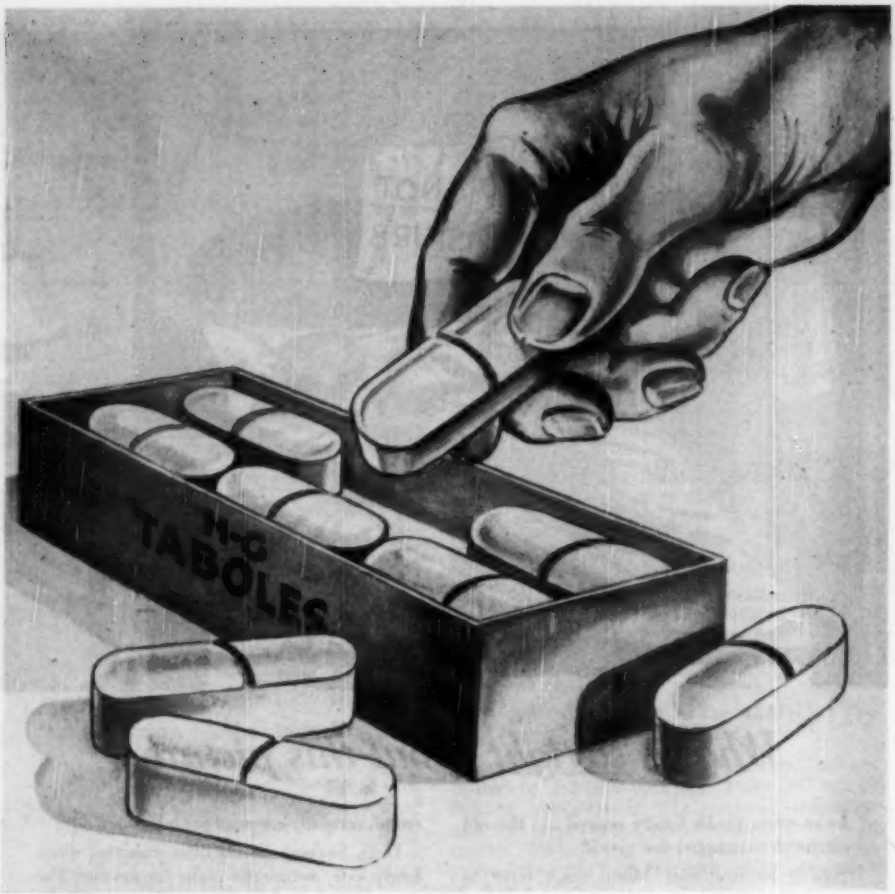
By signing up for one or the other of these plans, U. S. Savings Bonds are purchased for you out of your savings or income . . . automatically.

You *can't* forget to save . . . your saving is done for you! And remember, U. S. Savings Bonds pay you *4 dollars for every 3* invested, in ten years.

Start planning your own retirement today!

Automatic saving is sure saving – U.S. SAVINGS BONDS

Contributed by this magazine in co-operation with the Magazine Publishers of America as a public service.



accent on convenience

Time saved and convenience of administration are features of Tabole medication. *One* Tabole is equal to *four* sixty grain tablets given in a single dose. This explains the increasing demand for Taboles in large animal practice.

Haver-Glover Taboles are shaped to fit into the regular Balling Gun and they eliminate the expense of buying gelatin capsules. Each Tabole is creased for divided dosage as may be required, and while firmly compressed to avoid breakage, they are granulated with a suitable filler for rapid disintegration.

Taboles are an economical practice item so look over the following featured listings of the taboles now available: Astrengol, Phenothiazine, Streptocide, Sulfa Urea, Sulfa Combined, Sulfathiazole, Tanasul.

Convenience is the keynote to Tabole administration

HAVER-GLOVER LABORATORIES

Kansas City, Missouri

ANNIVERSARY MONTH

Silver Anniversary

Canine distemper anti-serum

In the August, 1925 JOURNAL of the American Veterinary Medical Association, announcement was made by Lockhart and associates of the first specific agents for the control of distemper in dogs caused by the virus of Carré.

Veterinary research in the intervening 25 years has not produced any procedures or products that have meant more to the veterinarian than this epochal discovery and announcement. Practicing veterinarians of the era prior to 1925 will agree that it was practically impossible to hospitalize dogs due to their imminent exposure to canine distemper. Thus the development of canine distemper anti-serum was one of the most important factors in the development of small animal practice as a specialty.

Anti-Canine Distemper Serum (Lockhart) was the original product, uncopied as yet in production features, and unparalleled as to performance. It is — as it always has been — the leader in its field.

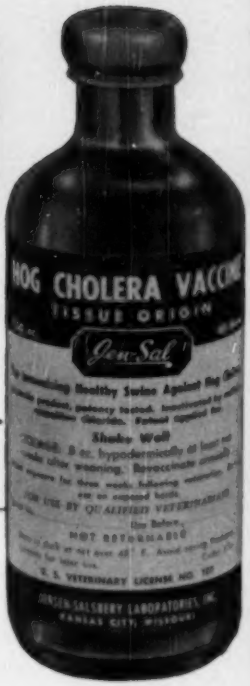
August, too, is another anniversary month. It has been just two years since Lockhart research presented to the veterinary profession another first, the first and only successful intradermal method designed for canine distemper immunization.

ASHE LOCKHART, INC.

"Producers of Better Biologicals for Graduate Veterinarians."

800 Woodswether Road Kansas City 6, Missouri

no virus reaction risk *when you use . .*



SAFE—No postvaccination leucopenia—no lowering of resistance to Salmonella or other swine pathogens—no febrile reactions.

ECONOMICAL—One 5-cc. subcutaneous dose confers full protection on shotes and adult swine . . . protection that lasts a year . . . without postvaccinal interruption of feeding schedules.

STERILE—Every bottle of Jen-Sal Hog Cholera Vaccine carries a certificate of sterility, a factor directly related to the protective value of hog cholera vaccines.

PROFESSIONAL PROTECTION—Jen-Sal Hog Cholera Vaccine, Tissue Origin, and all other Jen-Sal products are supplied to qualified veterinarians only.

SUPPLIED IN . . .
Vial 60 cc. (12 doses)
Vial 250 cc. (50 doses)

The best in hog cholera protection is labelled **Jen-Sal**